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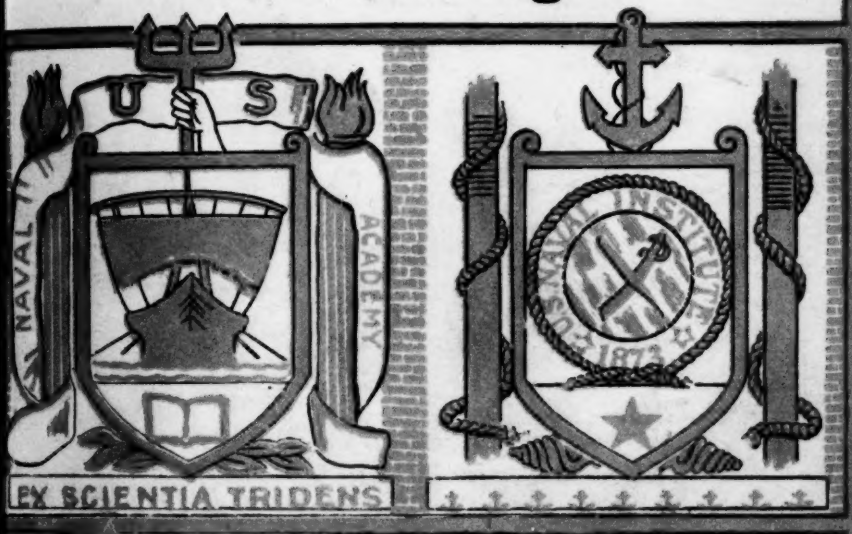

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Edited by H. G. S. Wallace

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THE NEW TORPEDO PLANE
(See footnote opposite)

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

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OUR TACTICAL READINESS FOR WAR

By Commander Russell Willson, U. S. Navy

The term "Tactical Readiness for War" may be used in a broad or in a narrow sense. In this article it is used in the more restricted sense as referring to our "Readiness for War" in the field of pure tactics. The collateral branches of tactics which are concerned with material and operating efficiency in communications, damage control, engineering and gunnery are here considered only for purposes of illustration and comparison.

On this basis "Our Tactical Readiness for War," may be defined as the degree of our knowledge and skill in the art of maneuver, position and combination,—the art which seeks to destroy the enemy by co-ordinating and concentrating against him the tactical elements of mobility, communications, protection and armament.

Standards of Tactical Readiness

In times of peace, no navy has been, or ever will be literally "ready for war." This is true in tactics as in any other branch

The New Torpedo Plane (See footnote opposite)

Editor's Note.—The Davis Douglas Torpedo plane, the latest development in naval aircraft, being prepared for a 1,200-mile flight from Washington, D. C., to Key West, Florida. This plane left the Naval Air Station, Anacostia, D. C., February 9, to join the torpedo and bombing plane squadron at Key West. Note the torpedo tubes under the fuselage.

of Naval Warfare. But in tactics, as in organization, strategy, logistics or plans, it is possible to establish certain standards of readiness which should be the goal of all naval endeavor. The first essential to forming an estimate of readiness for war, is an authoritative, complete, and definite statement of standards of readiness. There can be no measuring without a scale.

It is regrettable but true, that there has never been in our Navy such a set of standards. Various "War Plans" have provided the nearest approach to standards of readiness, but these standards generally have dealt with material readiness, and the number of days required to be ready for active operations. In many cases, and notably so in tactics, these requirements are so arranged as to provide no scale by which the state of readiness at any given time may be measured, and deficiencies detected. Fortunately this defect has been realized and will be corrected in the near future.

It may be assumed that such standards, whatever their form, will establish the following as essential to attaining a reasonable and practical degree of tactical readiness for war.

(a) Continuous, progressive, and exhaustive study in the theory and practice of all phases of tactics, including tactics of foreign navies.

(b) The results reduced to printed standard instructions in general use.

(c) Signal books, codes, and standard plans, essential to tactical operations in accordance with such instructions.

(d) Drill, exercise and instruction of the fleet under a continuing balanced program, to reach the highest attainable efficiency, in the technique of tactical operations.

(e) Research and experiment in the development of new tactical methods, weapons and types, and standard instructions for their use.

(f) A system of reports, comparisons, analyses, and permanent records of all tactical exercises, with a view to improvement in standard instructions and in technique of tactical operations.

PRESENT CONDITION OF TACTICAL READINESS

The above six essentials constitute the basis on which we should examine our "Tactical Readiness for War." In order that this

examination may lead to definite conclusions the following subdivisions will be considered separately:

(a) The Principles of Tactics.
(b) Major Tactics of the Balanced, or Ideal Fleet.
(c) Major Tactics of our Fleet as it is Today.
(d) Tactics of Subsidiary Operations.
(e) Minor Tactics or Tactics of Types.
(f) Tactical Research and Development.
(g) Tactics of Probable Opponents.

(a) *The Principles of Tactics:*

The principles of tactics and their application under past and present conditions of naval warfare, is the subject of much naval literature. As a natural result, there has been very considerable study and discussion of tactical principles, and the War College has produced a brief and authoritative pamphlet on the subject, which is fairly well distributed and is generally accepted. In the near future the principles of naval tactics will be set forth in the War Manual or other authoritative, widely distributed departmental publication. This, of course, should have been done before, but when it has been accomplished we may consider that insofar as the principles of tactics are concerned our condition of tactical readiness is satisfactory.

(b) *Major Tactics of the Balanced or Ideal Fleet:*

The major tactics of the balanced or ideal fleet is a subject of double importance. It furnishes the basis, and the theoretical background for the major tactics of our unbalanced fleet; it also contributes toward a better understanding of the tactics of probable opponents, more fortunate in their building programs, or more successful in their Conference diplomacy.

In our Navy the major tactics of the ideal fleet has received exhaustive study in theory and on the Tactical Game Board. In fact, until recently, the study of major tactics dealt more with the hoped-for fleet, than with the actual fleet. The results of such studies appear in War College papers, notably "The Naval Battle," and form the basis of the present War Instructions. On the whole there is a quite definite conception of the major tactics of the balanced fleet accepted in our service. We are justified in

saying that as regards this subdivision of our tactical readiness, conditions are fairly satisfactory.

(c) *The Major Tactics of our Fleet as it is Today:*

The treaties of the recent conference left us with an unbalanced fleet—unbalanced actually, and unbalanced relatively when compared with the British and the Japanese Fleets. We have a cruiserless fleet—and this lack of cruisers will continue for some years. While it is true that the tactics of our present fleet must largely be based on the tactics of a balanced fleet, yet the element of cruiserless tactics constitutes a distinct problem. It is well to know what we would do with battle cruisers and light cruisers; it is better to know what the enemy will do with them, but above all, we must know what to do without them.

Cruiserless tactics is one special and particular problem of our Navy, now and for some years to come. Nevertheless it plays an inconspicuous part in our naval activities. It is studied on the Tactical Game Boards, and appears incidentally in the occasional tactical exercises of the fleet. Yet there has been little or no serious investigation to determine how battleships can substitute for battle cruisers or destroyers for light cruisers. The fleet schedules and the budget estimates do not recognize this problem. In this respect standard instructions are deficient or totally lacking and there are no published records or analyses of tactical exercises.

We are deficient in the major tactics peculiar to our own unbalanced fleet.

(d) *Tactics of Subsidiary Operations:*

Subsidiary Operations may include:

Escort duty,
Landing Force operations,
Blockade,
Raiding operations,
Seizure of bases,
Defense of bases,
Operations against shore fortifications.

Compared with the tactics of the fleet engagement the tactics of such subsidiary operations are possibly of less importance,

certainly they have attracted less interest, and received less attention. But conditions may arise under which any one of these operations may attain surpassing importance, may in fact be the turning point in a war. For us, success or failure in seizing or holding a base in the western Pacific may mean victory or defeat. For the British in the World War, forcing the Dardanelles would have been a greater victory than crushing the German Fleet.

As a result of the last war we have considerable knowledge and experience and fairly standard instructions, in escort duty. We should remember, however, that our experience and our instructions are limited almost exclusively to conditions of submarine warfare, which may not recur in the same form. In the other types of subsidiary operations we have done but little. There has been some study and discussion, notably of the lessons of Gallipoli, and the work of the Control Force last winter was a beginning; but these problems have not been attacked seriously, and have had no considerable place in the fleet schedules of recent years. We have developed no standard instructions nor the special equipment which is essential to landing operations. We are strikingly deficient in the tactics of subsidiary operations.

(e) *Minor Tactics, or the Tactics of Types:*

Minor tactics, or the tactics of types, has unquestionably received considerable attention for years, but somehow, whether due to lack of continuity in planning, lack of experimental investigation, defects in our organization for tactical training, or lack of records and analysis, the results are not encouraging when judged by the instructions that have been produced, and the general standard of tactical knowledge.

The tactics of battleships has been studied in theory and in practice, and reduced to fairly complete written instructions. For battleships we have a workable signal system, a considerable degree of mutual understanding, fairly frequent drills and exercises, and less frequent reports and analyses. True, we have had an organized force of battleships for over twenty years, and have attained the present condition only within the past five years, but nevertheless, present conditions are what count, and we may take considerable satisfaction in the tactical readiness of our battle line.

Except for work on the tactical game board and the lessons of the Great War, the tactics of battle cruisers and of light cruisers is a virgin field. We cannot blame ourselves for this, perhaps, because we have no such ships, but in taking stock of our state of tactical readiness this item must be recorded.

The tactics of destroyers is on the mend. However, there can be scant satisfaction in this fact. We have had from 100 to 200 destroyers in commission for over four years, and last December it was necessary for the Department to rush through the Government Printing Office a book of Tentative Destroyer War Instructions, reconciling the even more tentative Destroyer Instructions of the Atlantic and Pacific Fleets, in order that destroyers could take part in the coming winter maneuvers on a common basis of understanding.

There have been for years considerable study and experiment in destroyer tactics, and several tentative pamphlets of doctrine and instructions. But after all, we have today tentative War Instructions for Destroyers, which in their entirety, at this moment,* have never been used. Of course there can be neither thorough training, mutual understanding, nor efficient co-ordination under these conditions.

The requirements of destroyer tactics are not entirely covered by the present signal books, and will be only when the Destroyer Instructions have attained some degree of permanence. Recently there has been some investigation of specific problems in destroyer tactics, notably in the Battle Fleet, and an encouraging thoroughness in the resulting reports and analyses. Everything considered, we can but say that in the question of destroyer tactics we have let much valuable time slip by, and while improving, are still far from being ready for war.

The light mine-layers are a product of the late war, and are few in number. In the past three years there has been some study of the tactical uses of this type, but as yet, we have no accepted doctrine and no definite standard instructions. The tactics of light mine-layers is undeveloped.

The tactics of submarines has received considerable attention since the war due largely to there being, in the Department, a section of Operations charged particularly with matters concerning

* January, 1923.

submarines. We have a book of Submarine Instructions, and the existence of this book marks a definite degree of progress. In the development of the tactics of fleet submarines we are of course deficient, and will remain so until we have fleet submarines in active commission. We are making progress in the tactics of the submarine, but there is much yet to be done.

Aircraft and aircraft carriers are new types—and their tactics are still in the development stage. It is too soon to pass judgment on the progress being made, but if we judge the future by the past, the prospects are none too bright.

From this brief discussion of minor tactics, or the tactics of types, we may summarize as follows:

Tactics of battleships—conditions fairly satisfactory.

Tactics of destroyers and submarines—after much loss of time and opportunity we are approaching the point where standard instructions are available, but as yet our destroyers and submarines are deficient in training and indoctrination.

Tactics of battle cruisers, light cruisers, light mine-layers, aircraft and aircraft carriers—either undeveloped or in the early stages of experimental development with nothing to promise that our indifferent success with older types will be exceeded with the new.

(f) *Tactical Research and Development:*

It is perhaps a mere commonplace to say that tactics, like any other branch of naval warfare, should always be looking to the future. Well-planned experiment, investigation, research, and development, were of increasing importance before the recent Conference, and are now more vital to our fighting efficiency than ever before in the history of our modern navy. Before the Conference we might expect a superiority in power and number of ships, now we may gain superiority only by developing a higher degree of fighting efficiency.

The importance of tactical development and research has been generally accepted in the abstract, but not fully applied in practice. Our tactical development has been slow in the past and has lagged behind development in other lines of endeavor, notably gunnery. We are deficient in tactical research and development, and will

probably continue so, until this element of tactical readiness receives in our service the recognition its importance demands.

(g) *Tactics of Probable Opponents:*

In the study of the tactics of other navies we have been fortunate in the associations of the war. Some say we have learned too much from the British, others, that we have learned too little. However, we can but admit that we have learned much to our advantage, both from their virtues and from their defects, and not only from the British but from the Germans.

Information of tactical development in a foreign navy is of double value. We may modify or adopt it for our own use, and we should certainly treasure it as a guide to the probable actions of an enemy.

Except under the unusual conditions of the late war, information of the tactics of possible opponents is difficult to obtain—especially that most desired—information as to new developments in weapons, types and methods. On the other hand tactical secrets are hard to keep—and given the same naval types, resulting tactical conceptions are apt to follow the same general lines. In this way the intensive study of our own problems is in reality a general study of the enemy's problems.

In general we have been quite successful in obtaining information of this kind. With the new tactical developments now in prospect it is of increased importance that no effort should be spared to obtain, disseminate, study, and act upon information of the tactics of other navies.

In the preceding paragraphs there have been set forth, under seven sub-heads, an estimate of the present condition of the tactical readiness of our fleet for war. If this analysis is substantially sound existing conditions may be indicated roughly by the following "marks" on the scale of 100, it being assumed for this purpose that a condition represented by less than 90 is not satisfactory.

On this basis the following "marks" may be considered as a conservative index of present conditions:

Principles of Tactics	95
Major Tactics of the Balanced or Ideal Fleet	90
Major Tactics of our Fleet as it is Today	60
Tactics of Subsidiary Operations	45

Minor Tactics or Tactics of Type		
Battleships	90	
Destroyers and Submarines	60	average 60
Other types	30	
Tactical research and development		50
Tactics of probable opponents		90
Average		70

Reduced to the customary naval scale of 4.0, this means that assuming a 3.6 as a satisfactory degree of readiness, present conditions are represented by a 2.8.

In order to check these estimates, fourteen officers from admiral to lieutenant commander were asked this question, "If you gave gunnery in the U. S. Navy a mark of 3.8, what mark would you give tactics?" The average of the answers was 2.65.

But having reached these figures, let us have no illusions as to their mathematical exactness; their value is entirely relative. Some may consider them too low, others may consider them too high; still others may doubt that a condition of tactical readiness can be represented in this way. Let each officer make his estimate in his own way. The conclusion will be substantially the same: OUR NAVY IS STRIKINGLY DEFICIENT IN TACTICAL READINESS FOR WAR.

CAUSES OF PRESENT CONDITIONS

Accepting this conclusion—that our Navy falls short of practicable and reasonable tactical readiness,—let us examine the causes of this condition, with a view to finding a remedy.

A very good way of analyzing an only fair performance is to compare it with a much better performance. It should be profitable, therefore, to study our tactical development in comparison with our gunnery.

As a branch of naval endeavor in which excellence is sought, gunnery possesses certain advantages over tactics. Gunnery involves the activities and interests of nearly all officers and men in a ship. Tactics concerns principally the officers. Gunnery is susceptible of being placed upon a competitive, or more properly, a comparative basis. Competition or comparison to the same extent is probably not practicable in tactics. But when the engineering competition was established there was considerable

doubt as to its practicability, yet it has succeeded admirably and the same effort toward competition and comparison in tactical efficiency, may well do likewise.

But in any case, the excellence of our gunnery, compared with our tactics, cannot be accounted for on the grounds of general interest and competition. There are other and more potent causes.

We have had for years, definite standards of gunnery efficiency which in effect are standards of readiness. As has already been pointed out, such standards for tactics have not existed, and are being prepared now only in the more general terms of the proposed war plans. There are no definite standards of excellence in tactics. In this fact lies one cause of our failure to attain a satisfactory degree of tactical readiness for war.

Naval thought for years has been oriented on the battleship. But the battleship presents the simplest problems in tactics and the most complex problems in gunnery. Unconsciously this subordination of tactics to gunnery, as found in the battleship, has been accepted as applying to other types of vessels and to the fleet as a whole. This is a serious error. The destroyer, for example, combines the most varied and most difficult forms of tactics, with relatively simple forms of gunnery. In fact the gunnery of the torpedo, the destroyer's major weapon, is ninety per cent tactics. Tactics is at least co-ordinate with gunnery, certainly not subordinate to gunnery. Our failure to appreciate this fact, or at least our failure to apply it in practice, is a second cause of our present deficiency in tactical readiness.

Gunnery has been "organized" with an office in the Navy Department for over twenty years. At present the Office of Gunnery Exercises and Engineering Competition is an office of high prestige, sound organization and acknowledged efficiency, working in close co-operation with the fleet and with the War College. It has developed standard instructions, reports, and analyses, to a degree unknown in any other form of naval activity. It has done much for tactics and material development in the form of experimental practices. It has established gunnery and engineering in a position where they not only measure the success and efficiency of ships and officers, but actually dominate the fuel estimates and operating schedules of the fleet.

Now as to tactics—while it is true that considerable experi-

mental work in tactics, as concerned with gunnery, is carried out under the Office of Gunnery exercises, yet it is also a fact that there is not now, and never has been, an office in the Department charged with tactical exercises and possessed of the prestige, organization or efficiency required to place the tactics of our Navy on the same plane as its gunnery. There is no officer, or office in the Navy Department specially and directly concerned with tactical readiness for war; no office charged with standardizing and analyzing tactical exercises, and co-ordinating them with other forms of exercises. In the gunnery office of any battleship one can find a red volume which tells what Battleship Division Three did in Division Practice, Torpedo Practice, even Small Arms Practice, in 1914 or any other year; also why they did not do better, plus what they thought should be done the next year. Did anyone ever see such a volume concerning the fleet maneuvers of 1916 off Long Island, or of 1919 off Cuba, or the joint maneuvers of 1921, or any other tactical exercises? Such books do not exist. Tactics is not "organized"—it has no "home office" in the Navy Department. This is the third and perhaps the most important cause of our tactical deficiency.

If gunnery has a marked advantage over tactics in the organization and administration of the Department, let us see how the two compare in the fleet.

An examination of the fleet schedules since the war, with due allowance for tactical training involved in gunnery exercises, shows a ratio of approximately six to one between the time allotted gunnery exercises and the time allotted to tactical exercises. And this is not all. We know that the gunnery year is the basis of the fleet year, that the time allotted to gunnery is inviolate, while time available for tactical work is too often subject to unforeseen interruptions and the demands of economy. The fuel shortage of the past year and a half is an excellent example. Drastic economy of fuel was necessary, so every activity of the fleet was curtailed—except gunnery.

A year's work in one active destroyer division of the Atlantic Fleet in 1920-21 involved two or three torpedo practices, and from six to ten gun practices per ship. In tactics the same division was never drilled at sea as part of a squadron, nor took part in a squadron attack, nor deployed for an attack. This

division carried out its part of the fleet schedule, yet it had only two opportunities for night search, and made no division or section night attack. This same division, in one year, was drilled by radio, without flags, for two hours, and in twelve months neither made a smoke screen nor passed through a smoke screen.

These conditions need not be considered typical, for in the same year, under the more favorable operating conditions at San Diego, the destroyers of the Pacific Fleet accomplished much of permanent tactical value; and one destroyer division in the Atlantic, *by being excused from all gun practices*, contributed definite information concerning co-ordinated torpedo attack.

But whether deduced from schedules and operating records, or whether accepted from the common knowledge of all officers who go to sea, it is a fact that in the apportionment of the time of the fleet, gunnery receives a far greater share than tactics. Tactics does not receive its proportionate share of the time and effort of the fleet. This is the fourth cause of our present deficiency in tactics.

NEW PROBLEMS

Having set down these four principal causes of our tactical deficiency, we should next consider the new tactical problems which now confront us. Having done this we shall have established a sound basis for constructive suggestions for attaining true tactical readiness for war.

One problem is that of "Cruiserless Tactics." This subject has been discussed at some length, with the conclusion that we are defective in our development of the major tactics of our cruiserless fleet, and almost totally lacking in the minor or type tactics of cruisers. Our numerous destroyers offer an available, though unsatisfactory substitute for light cruisers. They can and should be used in the investigation and development of the tactics of light cruisers, until we have a proper proportion of that type.

There is no prospect of our having battle cruisers, and the extent to which battleships may be substituted for them is a problem in itself. At present the six older battleships are assigned to the Scouting Fleet. There were several reasons, including that of expediency, which influenced this arrangement. Another reason was the desire to develop the tactical use of battle cruisers. Be-

cause of the Treaty for Limitation of Naval Armament, this purpose must now be modified to include that of developing the use of battleships as substitutes for battle cruisers.

Can the older battleships "back up" a scouting line? If so used, could they successfully engage the enemy battle cruisers, or would 14-inch battleships be necessary? How will aircraft carriers affect this question? If acting strategically as battle cruisers, can battleships continue that rôle, tactically, if and when the fleets approach? The actual "joining up" of such a detachment before, during, or after deployment of the battle line, is an interesting study in itself. As weaker battleships, such ships would probably be in the center of our battle line, as substitute battle cruisers, they would be on a flank. These are but a few of the questions of "Cruiserless Tactics" which are now pressing for solution.

Another problem is that of tactical mining. There is a tendency, sometimes, to dismiss the subject of tactical mining with the remark that mines so used would be as dangerous to our fleet as to the enemy. While this may not represent a serious opinion, it indicates a state of mind which is not helpful, if we are to develop the use of this important offensive and defensive weapon.

This subject of tactical mining is mentioned in only the most general terms in existing publications. We simply do not know the possibilities, the limitations, or the technique of the tactical use of mines, and something should be done to remedy this defect. Research and experiment in this line are inexpensive compared with torpedo work and yet we have done next to nothing. As mines may be dropped from aircraft, tactical mining is, in part, another phase of the aircraft problem, but it is more than that; it is closely related to the question of "Cruiserless Tactics." The head of the enemy battle line with his battle cruisers and light cruisers is not only better protected than our line can be, but such protection is of greater offensive strength. The development of tactical mining is one of the few promising means of combatting or neutralizing this superiority at the head of the line. Surely we should spare no effort to develop it.

A third problem comes from our increasing control over visibility. We have some acquaintance with the smoke screen laid by surface craft, but this development has been limited almost

entirely to the Battle Fleet destroyers, and has not yet reached the stage of standardized instructions commonly accepted—with all destroyers trained in smoke screen tactics. Smoke bombs and smoke shells provide another form of smoke screen, the tactical employment of which is still in the development stage.

The smoke screen, by whatever means produced, is of increasing importance in the field of major tactics. The combination of the smoke screen and indirect fire presents a problem which, with proper development, offers one of the most promising means of attaining a tactical superiority over our probable enemies.

The star shell presents another phase of the same problem of visibility control. For years the searchlight has had its ups and downs as a method of illumination. The star shell offers new possibilities, and new problems in the field of night fighting.

The fourth tactical problem demanding our attention, presents the greatest difficulties and the greatest possibilities. It is the problem of aircraft.

In the whole history of war at sea, one of the most difficult, and one of the most persistent problems, has been how best to recognize at its true value, that which is new. We are all familiar with the errors of the over-sanguine—the failure of the dynamite gun, the torpedo, the mine and the submarine, to live up to the extravagant claims of their proponents. On the other hand, many have erred at the other extreme, and of the two, this latter is the more dangerous.

The following extract from the introduction to the *History of the U. S. Navy*, by J. Fenimore Cooper, written in 1839 should serve as a warning to the over conservative:

> There is an opinion becoming prevalent that the use of steam will supersede the old mode of conducting naval warfare. Like most novel and bold propositions, this new doctrine has obtained advocates, who have yielded their convictions to the influence of their imaginations, rather than to the influence of reflection.
>
> No vessel can be built of sufficient force and size, to transport a sufficiency of fuel, provisions, munitions of war, and guns, to contend with even a heavy frigate.
>
> Steam may be, and most probably will be made a powerful auxiliary of the present mode of naval warfare, but it is by no means likely to supplant it. Fleets may be accompanied by steamers, but their warfare will be conducted by the present classes of heavy ships, since it is not possible

to give sufficient powers of annoyance, or endurance, to vessels propelled by steam.

The airplane will not make the battleship obsolete in the near future; but nevertheless, the airplane will have more effect on naval warfare than the torpedo, the mine, or the submarine. These weapons have influenced and continue to influence warfare at sea, yet aeronautics, still in its infancy, confronts us wherever we turn, whether it be to strategy, tactics, gunnery, or communications.

But after all, our problem is not so much what the airplane will eventually do to battleships, or to naval warfare in general; our particular problem is, what we should do to develop aircraft as our own weapon, and to devise counter-measures against aircraft as an enemy weapon. In doing this we should be most particular to maintain an open mind, and a determination to lead, and not to follow. In the art of naval war we are entering strange waters, with new currents, new beacons, and new dangers. In this broken sea let us pull out to meet each wave of progress, lest it come upon us suddenly and we be swamped.

Specifically, the following problems in connection with aircraft confront us at this time:

Effect of aircraft on major tactics,
The minor tactics of aircraft,
The tactics and tactical use of aircraft carriers,
Use of aircraft in screening,
Use of aircraft in controlling visibility,
Tactical mining from aircraft,
Attack by, and defense against torpedo planes,
Attack by, and defense against bombing planes,
Use of aircraft observation in control of fire.

These problems will not be discussed in detail—any one of them might be made the subject of a separate article. It is only necessary to mention them to show that in aircraft alone we have problems more complex, more exacting, and more formidable, than those of the past which we have met with none too complete success.

CONCLUSIONS

If this discussion has been logically developed to this point, it has established the following facts:

First: That our fleet at present is deficient in tactical readiness for war.

Second: That there are four principal causes for this deficiency.

(a) Lack of definite standards of tactical readiness and tactical excellence.

(b) Failure to appreciate the co-ordinate importance of tactics compared with other forms of training and development, notably gunnery.

(c) Lack of an office in the Department bearing the same relation to tactics that the office of Gunnery Exercises bears to gunnery.

(d) Failure of the fleet schedules, and the budget estimates, to provide a due proportion of available time, effort, and fuel, for tactical training and development.

Third: That there now confront us new problems in tactics, more complex, more far-reaching and more vital, than the older tactical problems in mastering which we have met only the indifferent success reflected in our present condition of tactical unreadiness.

SUGGESTIONS FOR ATTAINING TACTICAL READINESS

These three facts must form the basis of suggestions as to what should be done in tactics to correct mistakes of the past, overcome present deficiencies, and provide for meeting the problems of the future. On this basis, I offer the following suggestions for attaining and maintaining, in times of peace, a practical and reasonable degree of tactical readiness for war.

First: Establish definite standards of tactical readiness in the war plans, and then develop standards of tactical excellence comparable with present gunnery standards.

Second: Indoctrinate the service with a sound conception of the co-ordinate place which tactics should occupy in the development, training, and readiness of the fleet for war, together with a clear understanding of how and why, under present conditions, tactics falls short of attaining this position.

Third: Expand the present Office of Gunnery Exercises and Engineering Competitions to include tactics in the same general relation to the fleet as now exists for gunnery, but with particular emphasis on co-ordination, standard instructions, data keeping, and analysis. This office to be known hereafter as the "Office of Fleet Training," or by other appropriate title, and preferably to be under the direction of a flag officer.

Fourth: Prepare the budget estimates and the fleet schedules so that the time, effort, and fuel available for development and training may be divided between strategy, tactics, gunnery, and engineering in proper proportion—such proportion to be determined by a sound estimate of the relative importance of these branches, *and a close study of the current degree of readiness in each.*

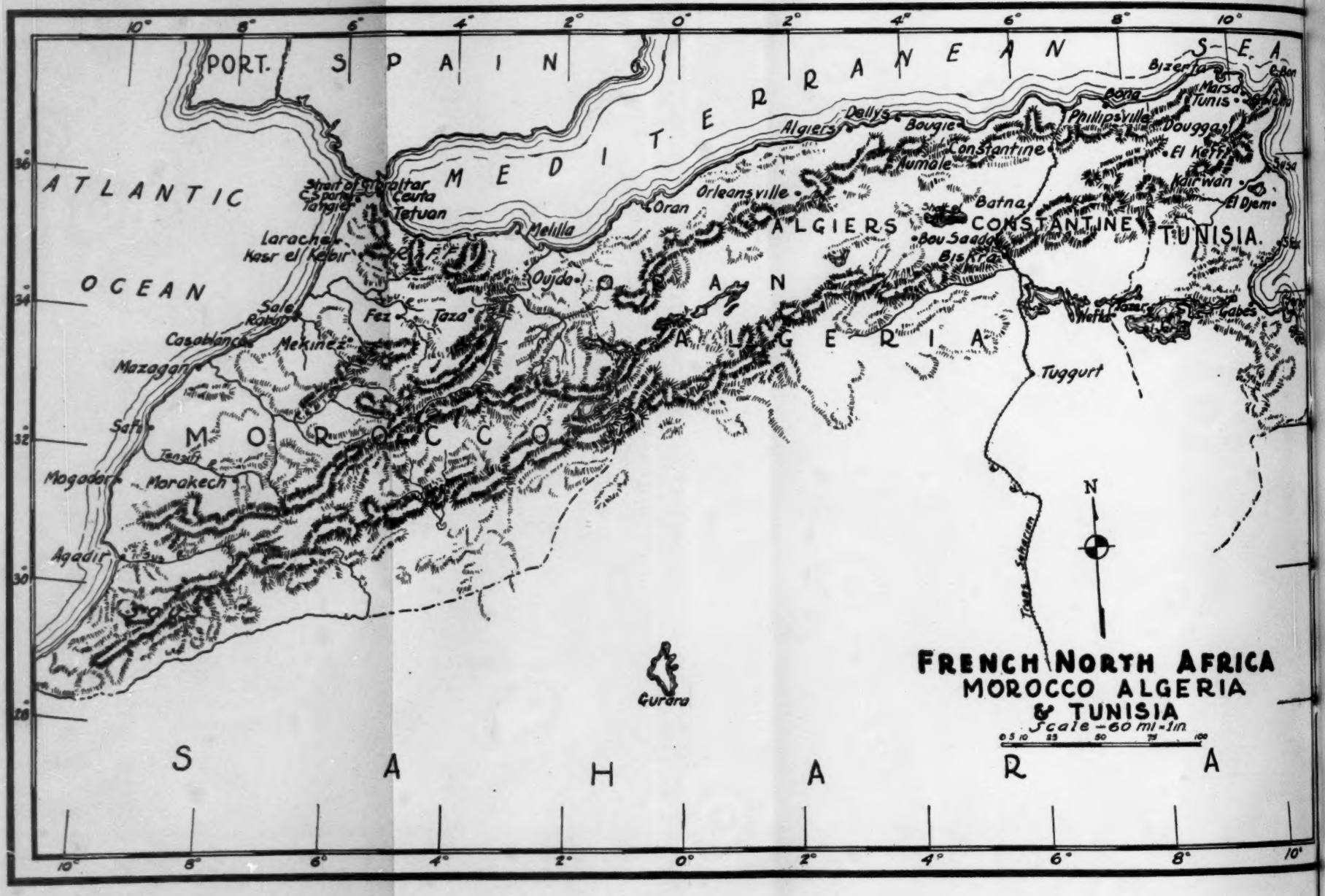
The first suggestion—standards of tactical readiness—should be met by the War Plans Division of Naval Operations. As to definite standards of tactical excellence, they should be developed by the fleet in conjunction with the proposed "Office of Fleet Training."

Toward meeting the second of these suggestions—a clearer conception of the importance of tactics, and of our present shortcomings—it is hoped this article may be a small contribution. But substantial progress in this respect can come only from united effort on the part of the Navy Department, the Fleet, and the War College.

The third suggestion—expansion of the Office of Gunnery Exercises into an Office of Fleet Training—proposes to do for tactics not only what has already been done for gunnery, but also to furnish the machinery for co-ordinating tactics and gunnery, and for obtaining continuity of training, and permanence of records in both.

The fourth suggestion—that the fleet schedules and the budget estimates be prepared on the basis of a balanced program of development and training—will be realized as soon as the fleet and the budget office have the opportunity to develop, in their relations with the proposed Office of Fleet Training, the same close co-operation that now exists between them and the Office of Gunnery Exercises.

We have today a fleet unbalanced in the types which compose it, and unbalanced in the training and development which measures its fighting efficiency. To correct the former lies largely with Congress, to correct the latter lies entirely with us.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LETTERS OF A RETIRED REAR ADMIRAL TO HIS SON IN THE NAVY

By Rear Admiral A. P. Niblack, U. S. Navy

Letter No. 14

BARBARY PIRATES, ALGERIA AND TUNISIA COLONIAL VS. PROTECTORATE FORM OF GOVERNMENT

Hope Farm,
Long Island, N. Y.,
January 30, 1923.

Dear Son:

The city of Algiers is not as interesting as Tunis, for it is too modern, too French, and the native population has been too long in contact with Europeans. It is not even safe to loiter about the native quarter, the Casba, but that is more an indictment of our civilization than of the native. The "melting pot" has brought too much scum to the surface in that particular locality. In all other parts of North Africa the native shows to better advantage since his vices and faults are his own, and not borrowed. Other peoples' vices are usually not as tolerable as our own, but new ones have, at least, the merit of novelty. As less than a third of the world's population is white, it is always painful to see natives act too white. The more I am brought into contact with Moslem peoples, the more I realize how much they have to lose by changing their religion and their vices for ours. Their virtues and their vices are essentially elementary. Silent, honest, frugal, abstemious, courteous and fatalistic, they appeal to one after being jostled about by our civilization.

Having gotten to Algiers, you are at the beginning of the "Barbary Coast"; the rubber ring on which the young American

Navy cut its teeth; the training school of the officers of our Navy in seamanship and daring, enabling them in the single ship actions of the War of 1812 to bring home souvenirs of their prowess as seamen and sea-fighters; for it was the wars against and the long blockades of the Barbary pirates which put the keen edge on our Navy. As a matter of fact, our war with Algiers was not until 1815, but those with Tripoli and Tunis are what I have in mind. From 1801-5 our squadron, successively commanded by Dale, Morris, Preble, Barron and Rodgers blockaded Tripoli and repeatedly attacked the defenses of that port. On February 19, 1804, Decatur burned the *Philadelphia* in the harbor of Tripoli, having previously taken personal part in other attacks on the city. In the same year, Mr. William Eaton, our Diplomatic Agent in Tunis, subsequently supported by a squadron under Commodore John Rodgers, ended the piratical attacks on our shipping at the hands of the Bey of Tunis. In 1815 our Government declared war on the Dey of Algiers and sent a squadron of ten ships under Commodore Decatur, which brought him to terms and also exacted indemnities from the Bey of Tunis and the Bey of Tripoli for violations of the Treaties of 1805. It was this vigorous example by our young country which encouraged European countries to finish up the job of putting the pirates entirely out of the business. Verily, the Navy is the long arm of the country to put the seal on diplomatic agreements and prevent them from being regarded as mere scraps of paper.

The treaty obtained by Decatur from the Dey of Algiers forever exempted our shipping from tribute; abolished the enslavement of prisoners; imposed conditions under which American citizens could only be tried in the native courts; and exacted a payment of six million dollars for previous damages inflicted upon our shipping. As previously stated, Tunis and Tripoli were at the same time likewise put in order and fined for violations of treaties. In fact, for a peaceful republic, we seem to have gotten our money's worth out of the Navy by wars in every generation of our history. Next time it is called upon, we will need more Navy than we are at present allowed.

If anyone should suggest to you that we should economize on the Navy or the Army either, just tell them that we were in the recent World War only 584 days or 14,016 hours and it cost us

over $1,500,000 each hour, not including $750,000 each hour in loans to the Allies, which we are still looking for. One week of peace at that rate ought to furnish a Navy with the fighting edge, without Barbary pirates to practice on. The trouble with our country just now is that we have too much money, and nine pairs of trousers in every ten wear out in the seat.

The U. S. Navy is on its feet and, although swivel chair critics tell us that the aerial bomb has scrapped the battleship and replaced the gun as the supreme weapon of naval warfare, do not swallow such stuff! The French Navy is where it is today by accepting something "just as good" as the gun and battleship: viz., commercial destroyers, submarines and aerial bombs. The result to France has been the usual one of falling between two stools. With us the General Board has been a great stabilizer and has put the biggest guns possible on everything that can carry them. While our Navy is not as well balanced as it should be, it, at least, does not lack guns. In the recent discussion in England in the newspapers over the obsolescence of the battleship, the fight raged between retired naval officers. Not one single officer on the active list took part, and no one even suggested that the problem was merely that of re-designing the ship that carries the gun or altering it to meet the new conditions which have arisen. It is the business of active officers to use the instruments placed in their hands, and if the retired officers get scared over the alarming situation they, at least, showed commendable interest even if misguided. War being the application of science to putting the enemy out of business and making peace as soon as possible, it might seem that warfare would be revolutionized by every new invention. The joke is it is not. The gun remains the supreme weapon of naval warfare. The other talk is too often cheap advertisement to keep some back number in the spotlight. "Johnny, get your gun!" is the answer; but, at the same time, Johnny should not let them get his goat.

In the days of Rome and Carthage the eastern part of Algeria was called Numidia and the western part, including Morocco, Mauretania. An atlas will show you that two ranges of the Atlas mountains traverse North Africa from the Atlantic to the very interesting Gulf of Gabes, the northern range being known as the Mediterranean, or Little Atlas, and the southern as the Saharan,

or great Atlas. Algeria has 650 miles of broken coast line and Tunisia about 180 miles on the northern coast and 400 miles on the eastern coast, all of which coast line is indented by numerous bays, several of which have been made into wonderful harbors. In the main, however, most of the harbors are artificial, and it is the construction of adequate port facilities which calls for a large expenditure of money at this time and is one of the financial problems which France has to face. In Bizerta the French have a harbor and basin unique in their natural perfection, without any of the labor or expense which is usually entailed in the creation of a great commercial port as well as a naval base. Between Bizerta and the harbor of Tunis is the recently discovered but almost filled-in harbor of ancient Carthage, of which I shall tell you more later.

The land extending back from the sea beyond Algeria and Tunisia, to the slopes of the Little Atlas, is called the Tell and is extremely fertile and well-watered. This was the ancient granary of Rome as it is of France today. The plateau between the two Atlas ranges, back of the Tell, is not very fertile and is cut up by numerous saline lakes or schotts which generally evaporate in the dry season, leaving a thick solution of salt on the bottom; obviously the beginning of the waste lands leading to the Sahara. The Algerian Sahara beyond the Great Atlas, far from being *sandy* waste, is a rocky plateau with an average elevation of 1,500 feet interspersed with oases and some pasture land.

On the other hand, the southern part of Tunisia belongs to the Great Sahara Desert and is the quickest and easiest way to enter the Desert, since the town of Gabes, on the Gulf of Gabes, is actually an oasis of the Desert on the very edge of the sea. The adjacent oases of Tozeur and Nefta, well down into the sandy desert, are easily reached by railroad and caravan. This whole region of southern Tunisia is known as the Jerid, with its salt lakes and wonderful hot springs fitted up in Roman days as luxurious baths. It is astonishing and weird in traveling through eastern Algeria and central and southern Tunisia, to encounter, in desolate regions, the splendid remains of Roman cities like Timgad, Dougga, Pont du Fahs and Djem, as if abandoned in some great calamity. There are no such ruins else-

where because the conquerors and the churches have torn down the noble ruins for building purposes, whereas the nomads of this region have had no use for building material. The Roman cities nearer the sea have been wholly demolished, and the cities of Tunis and Kirawan have been largely constructed from adjacent Roman ruins.

As the mineral products of Algeria and Tunisia are iron, zinc, lead, copper, quicksilver, sulphur, phosphates, gypsum, salt, onyx and beautiful white and red marbles, it is not unusual to find that the presence of the mines and quarries was well known to the ancients. In the region of the Jerid the products are olives and olive oil, dates and esparto grass for weaving, but everywhere in North Africa back from the fertile coast lines are the innumerable flocks and herds of the nomadic peoples, sheep, goats, cattle, donkeys, horses, mules and camels, not the real camel with two humps, but the dromedary, for the two-hump camel is the Asiatic variety and the dromedary is the real ship of the desert. Nothing, however, hurts my feelings worse than to see one of these ships of the desert driven to a cart in shafts, as is done in Tunisia, and sometimes with a donkey as a side partner. It has been my good fortune to make two trips to the Desert, or rather to oases in the Desert, and to me the most interesting product of the Desert is the Bedouins, those curious gypsy-like nomads who are so different from the Arabs and who seem out of place and hangers-on to a civilization to which they add nothing but picturesqueness. They are scattered throughout the desolate regions from Persia by way of Syria and Egypt throughout the Sahara to the Atlantic Ocean and down to the negro countries in the southern part of the Sahara. Of nomadic Arab origin, tent dwellers, gypsies of the desert, citizens of no country, their hand is against every man and every man's hand against them.

It is very hard to give you an idea of the exact area covered by Algeria and Tunisia, but the definite bounds of Algeria are three times larger than Tunisia. The limits of each country toward the desert region are rather vague and being extended all the time. Roughly, Tunisia is as large as the New England States and Algeria larger than the New England and Central States combined. In neither case does this include the Sahara

desert region. For instance, when the President of France visited Algiers in 1922, he received with state ceremonials the Tuareg (Berber) chiefs, loyal to France, who had journeyed forty days by mule or camel to make the trip to pay homage to him. These men wore magnificent costumes, quite as handsome as those worn by hundreds of other native kaids present, but they also wore veils up to their eyes, a custom due more to protection against sand in the desert than from native modesty, since they are warlike and make great soldiers.

The population of Algeria is over 5,000,000 souls and Tunisia less than 2,000,000. The other than native population is French, Spanish, Italian, Maltese, Turkish and Jewish. The native stock is predominately Berber, and the rest, Arab, Moor, Bedouin, and Negro. There is a large mixed element, descendants of the Arabs, Berbers, Romans, Phoenicians, and Teutonic Vandals. In Algeria there are about 170,000 naturalized French citizens in all but, in Tunisia, the Italians outnumber the French.

The Jews, numerous throughout North Africa, are an interesting complication in the population. There are nearly 60,000 in Algeria, still more in Tunisia and still more in Morocco, and all live under Arab and Moorish domination. It has been a rigorous one. Compelled to live in ghettos in the cities, to be limited to certain trades, and to wear a distinctive costume on the streets, the Jews, during all these centuries, have naturally remained a foreign element in the community. In their social life and domestic life they have preserved their own religion, traditions, and "kultur," as they have throughout the centuries in all communities, making them a "foreign element" in nearly all European countries. Some of the most beautiful costumes I have ever seen were the Jewish bridal dresses of a century ago, if pantaloons, compulsory for Jewish women in North Africa, can be called dresses.

To me, also, an interesting feature of North Africa is the Moors, a mixture of the Semitic Arabs and Hamitic Berbers, which latter are related to the Iberian peoples of Europe. After the death of Mahomet, the Arabs, in their almost world conquest, overran North Africa in the latter part of the seventh century, driving the Berbers to the Atlas mountains, ultimately converting them to Islam, and mixing with them according to the Mo-

hammedan customs. Prior to and during the conquest of Spain and their being driven out by Ferdinand and Isabella in 1492, the Moors developed as a real hybrid race, their civilization flowered, and they fell back into Africa, to dominate it for a considerable period. There is thus a race of Moors distinct from the Arabs and Berbers yet derived from a fusion of the two stocks primarily admixtured during their incursion into Europe which had reached its high water mark when Charles Martel defeated them in 732 near Tours and drove them back across the Pyrenees into Spain, where they remained until entirely driven out by the Spaniards in 1492.

It is interesting to note that it cost France six billion francs and took her sixty years to accomplish the pacification of Algeria, whereas the establishment of France in Morocco and its pacification has taken only ten years and cost her only one-twentieth of the above sum. I have told you something of this French occupation of Morocco, and the brilliant administrative achievements of Marshal Lyautey, in that protectorate. Much of this is, of course, due to previous colonial experience. Algeria is a French colony, while Morocco and Tunisia are protectorates, due to unfortunate colonial experiments. When the war came suddenly in August, 1914, the Bey of Tunis and the Sultan of Morocco conscripted native troops to fight in France, while, on the other hand, the French Government did not feel itself strong enough in Algeria to use conscription and resorted to the voluntary system. The exact figures have not been published, but, in a general way, Morocco furnished 50,000 native troops for service in France and many times that number to fight in Morocco on the northern, eastern and southern frontiers against the wild tribes incited and aided by the Germans. Algeria, with more than two and one-half times the population of Tunisia, furnished 120,000 troops and Tunisia 90,000. This is one reason why the protectorate form of government has advantages over the colonial, since any unpopularity of any official acts or laws is borne by the government. The losses amongst the native troops were very heavy and one can see the effects of it in Tunisia today by the shortage of labor in the fields.

The French conquest of Algeria is interesting historically. Following Decatur's humiliation of the Dey of Algiers in 1815, his

successor had taken it out on European countries, and France had many outstanding grievances on account of piratical acts. A dispute had arisen over the payment of a debt owed by the French Government to two Jewish merchants in Algiers and, while the matter was pending in the French courts, the Dey, Hussein, who also owed the Jews money, wrote an undiplomatic letter to the King of France, who did not reply. At a reception of the Consuls in 1830, the Dey taxed the French Consul with not having received a reply and in an exchange of words, Hussein angrily struck the French Consul. It was the end of an imperfect Dey, for he and his Turkish régime were expelled by the French fleet and a strong army under General Bourmont. But the Arabs, under a young and able emir, Abd-el-Kader, fought the French, off and on, for a period of seventeen years but finally surrendered in 1847. The Kabyles (Berbers), however, kept up a desultory warfare, compelling France to maintain a military government until 1864, when Marshal MacMahon became Governor-General and Emperor Napoleon III came to Algiers and proclaimed a constitution and a regency. But serious insurrections occurred until 1871, when a civil government was established. In 1881, after negotiations with and pressure on the Bey of Tunis, France established a protectorate over Tunisia in order to safeguard her interests in Algeria and has made no such mistakes in dealing with the natives in that regency.

The administration of Algeria is vested in a Government-General, who is assisted by a Council. Under the law of December 2, 1902, the administration is divided into two parts, Algeria proper and the Southern Territories, with separate administrations and separate budgets, but both under the one Governor-General. The three departments into which Algeria proper is divided are Algiers, Oran and Constantine, which have their own councils but send delegates to the Superior Council at Algiers, which meets once a year for the purpose of discussing the general budget. Each one of these three departments sends one senator to the Senate at Paris and two deputies to the House of Deputies. The Southern Territories are constituted out of the southern portion of Algeria and the northern Sahara Desert.

All of the laws of Algeria are framed in Paris and the military expenditures of occupation are borne by the French Gov-

ernment. Justice is administered by sixteen courts, justices of the peace, commercial courts and a court of appeals, situated at Algiers. The French criminal laws obtain in these courts, but for affairs between natives and Europeans or natives and the French Government there are so-called Bureaux Arabes, which also supervise the religious affairs of the natives. The financial system of Algeria closely resembles that of France and the administration of the three departments is the same as in France, with the Prefect and the cumbersome bureaucracy. Algeria has its own budget, can grant railroad franchises, award public contracts and runs its own schools, but has the disadvantage of having its laws made in Paris and is much more controlled from Paris than Tunisia and Morocco, which is another advantage of the protectorate form of government.

In Tunisia the nominal head of the government is the Bey of Tunis, who is assisted by nine ministers in his cabinet. The French Resident General is Minister of Foreign Affairs and virtually the viceroy. Of the nine ministers seven are French and only two natives. There are thirteen civil and two military districts in which the native administrations, nominally under the Bey, are supervised by thirteen French *controlleurs,* with French and Tunisian assistants. All foreigners are governed directly by the French both administratively and judicially. The success of the Tunisian administration gave an excellent example for Morocco.

The first railway line was inaugurated April 2, 1875, known as the Bone-Guelma Railway, and now amounts to 1,500 miles in Tunisia and 2,400 miles in Algeria. You can now go from the Gulf of Gabys to Casablanca in Morocco on the Atlantic by rail. The great problem, of course, is the French Trans-Sahara Railroad to solidify the French colonial empire in Africa. In a few months the Cape to Cairo Railroad will be completed, running a little less than 3,000 miles completely through British territory. France is financially not able at the present time to push through the great railroad enterprise which will do as much for her own African colonies, but there is really no lack of French enterprise in North Africa considering the financial restrictions which limit them. They are pushing ahead and it is a revelation to see what they have so far accomplished and how well they handle the native population.

On December 17, 1922, a French expedition, in motor cars, left Tuggurt, the Algerian terminus of the Trans-Saharan Railway, and arrived January 7 at Timbuctoo, a journey of nearly 2,000 miles across the Sahara. There were four cars and eight persons in the party and oil had previously been stored at the end of the first 500 miles of the route, and 300 miles out from Timbuctoo. The wells along the route had been previously located, but over the central and most dangerous stretches the party has to be self-supporting in food, water and oil, and had to carry spare parts, and weapons to protect them against the savage raiders, and shelters from the even more savage extremes of the climate. The London *Times* says: "In the thin and clear atmosphere of the desert the sun scorches the ground by day, and at night the temperature often sinks far below freezing point. Fierce winds gather up the dry sand into whirling pillars of disaster, or drive it before them in a blinding and suffocating fog, rasping the lungs of men and the machinery of cars. Nor is the Sahara a flat plain along which, when weather permits, a straight course may be steered from oasis to oasis. It is a rugged country, scarred and carved by the erosion of water in the past, of blown sand in the present. The contours are disturbed by deep ravines and lofty hills. The traveler has to thread a devious way, now over shifting drifts of sand, now over the black teeth of the native rocks. That men can endure such a journey seems wonderful; that machines have conquered it, a miracle." This motor trip may be said to have blazed the way for the French Trans-Saharan Railway which will unquestionably be built when money becomes available.

France has put her hand to the plow in Africa and cannot turn back, nor does she mean to do so. She has, in her African empire, a new France and knows it. Financially France is weak; spiritually she is strong. Nowhere have I met more sincere, high-minded, self-reliant, public-spirited gentlemen than in the French Army and Navy in North Africa. Contact with the natives seems to have softened them after the shock and strain of the great assault which came to France in 1914.

Your affectionate

DAD.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

HOW THE MARINE BAND STARTED

By Major Edwin N. McClellan, U. S. Marine Corps
Marine Corps Historian

So many and varying accounts have been given of the first organization of the Marine Band of Washington, that it is time that the real, and interesting, true story should be told.

The Marine Band did not just happen into being, nor were its beginnings in an Act of Congress. There always have been "Musics" in the Marine Corps—from its birthday on November 10, 1775, to date—but it was not until 1800 that the Marine Band had its inception; and like every one of the Marine bands playing today, it was first composed of volunteer musicians from the line.

At the end of the Revolution in 1783, the American people looked upon the soldier, sailor, or Marine, as a man out of a job. He was; and until July 11, 1798—when Congress authorized the Marine Corps—the only Marines were those serving in the State Navies, and a few serving on board the frigates of the "New Navy" in 1797.

William Ward Burrows, a native of South Carolina, but a Philadelphian by adoption, was the first Commandant of the Marine Corps. He was a lawyer, an organizer, and according to Washington Irving, "a gentleman of accomplished mind and polished manner." Of him the editor of *Poulson's American Daily Advertiser,* wrote in 1805, "his services in nursing the infant corps over which he presided, so useful to our naval enterprizes, ought to be particularly commended by a grateful country." At first "Major Commandant," and later "Lieutenant-Colonel Commandant," it was he who fathered the Marine Band.

The first Headquarters of the Corps was under canvas a short

distance from the heart of the City of Philadelphia, which at that time—July, 1798—was the capital of the United States. The capital moved to Washington in 1800, and with it went the Marine Corps. Shortly after Headquarters arrived in Washington from Philadelphia, Major Burrows proposed to Secretary of the Navy Stoddert, that the Marines organize a band of music to be stationed "at the seat of the Government," where Headquarters must always be, for the President's as well as for other officials' use. He told him that the law had authorized "thirty-two drums and fifes," as the Marine "Musics" were called, and that the "Drum and Fife Major" could act as leader of the proposed Marine Band. The Secretary quickly approved the suggestion, and Major Burrows started at once to gather together the members of the band and to secure the necessary instruments.

Orders were issued for the recruiting officers to send to Headquarters all recruits who could play musical instruments, as well as any likely youngsters who might learn quickly. It was not long before there was a sufficient number of fifers, drummers, and privates gathered in Washington to form the band. Then the instruments had to be secured. But these cost money and there was no appropriation from which expenditures could be made to purchase them. However, there was the "Music Fund" formed by personal subscriptions by the officers for the purpose of paying bounties for the enlistment of "Musics." Instruments were paid for from this fund for several years, then from the appropriations for "Contingent Expenses" and "Music," until, in 1805, Congress appropriated for "Musical Instruments."

So far as the records show, the first purchase of instruments was made on an order issued August 31, 1800, by the Commandant to First Lieutenant Edward Hall, who was in Philadelphia, to procure two French horns, two C clarinets, one bassoon, one bass drum, and reeds for the clarinets and the bassoon. Lieutenant Hall was specially advised to have a "judge of musical instruments" select them. But the bass drum could not be obtained in Philadelphia, so the Commandant tried to have the drum made in Baltimore. The anxiety of the Commandant to have the instruments arrive in Washington is shown by his frequent letters to Lieutenant Hall in Philadelphia, trying to hurry them up.

At last, about November 1, the instruments did arrive. More

instruments were secured from New York. Then came the Commandant's gleeful announcement to Captain Franklin Wharton in Philadelphia on the first of December, 1800, that "each boy who is learning, can already play a tune." The problem of securing a bass drum, however, remained a difficult one to solve, and in the meantime, the band did the best it could without it.

Probably the first important appearance of the Marine Band was at the inauguration of President Thomas Jefferson, March 4, 1801. The next was in Washington on the Fourth of July in the same year. The *National Intelligencer* published a glowing account of that celebration. "About twelve o'clock the President was waited upon by the heads of Departments, and other officials civil and military, foreign diplomatic characters, strangers of distinction, the Cherokee Chiefs at present on a mission to the seat of Government, and most of the respectable citizens of Washington and Georgetown."

"Sometime after the company had assembled," it continues, "Lieutenant Colonel Burrows, at the head of the Marine Corps, saluted the President" while the Marine Band played "with great precision and with inspiring animation the *President's March*," as the Marines "went through the usual evolutions in a masterly manner, fired sixteen rounds in platoons, and concluded with a general *feu de joie*. The Band at intervals during the morning played martial and patriotic airs."

"At four o'clock a numerous and respectable company" assembled. Among them were the Heads of the Departments, other high officials, "and most, if not all, of the civil officers attached to the general government, the officers of the Marine Corps, and those of the frigates, with a number of military gentlemen at present at the seat of government."

"During the dinner, and until the company separated, a full Band of Music, detached from Lieutenant-Colonel Burrows's Corps, played patriotic and festive airs, and each toast was announced by a discharge of artillery, returned from one of the frigates."

But the band played without a bass drum, despite the earnest efforts that had been made to secure one. Late in July of the same year Captain Wharton in Philadelphia wrote his Commandant that "after many researches" he had "met with Frayley,

Drum-maker," who "was to show him a Bass Drum, which, if not suitable" he would not accept, but that Mr. Frayley had promised "to make one of any quality required." There is no further mention of the drum, so this last attempt seems to have been successful.

July 4, 1802, was a fête day at the Navy Yard, and the Marine Band was one of the attractions. "The arrangements at the Navy Yard were made, under the superintendence of Captain Tingey and Lieutenant-Colonel Burrows, with a very happy regard to elegance and accommodation," reported the *National Intelligencer*. "The ladies were received under a handsome markee, until dinner time, when the company was arranged at an extensive table in the form of a hollow square, under a lofty tent covered with the colors of the frigates, which lay within view, ornamented with flags of all Nations."

The fame of the band spread, and it was in frequent demand for private as well as official occasions. The Marines of the band early learned that a little spare cash could be picked up. The "customary price" of the band for playing outside its duties was fifty dollars in addition to expenses. It played on many occasions in Washington, Alexandria, Georgetown, and other places. That it also played at official functions, both at the White House and elsewhere, goes without saying.

Lieutenant-Colonel Wharton succeeded Lieutenant-Colonel Burrows as Commandant in 1804. A full year later he was amazed to receive a letter dated February 28, 1805, from Captain John Hall, on the *Congress*, at Palermo, Italy, stating that he had regularly enlisted as Marines a "Band of Music" for the Corps, and had supplied them with instruments at the expense of the Corps. One month later, Captain Hall wrote to the Commandant from Messina, that under orders of Commodore Barron he had visited Catania "for the purpose of procuring a Band"; that he had "been fortunate enough to enlist fourteen good musicians for the Marine Corps"; that he had secured instruments at Messina, and as soon as they were received he would "render an account of all expenses" to the Commandant, according to to his orders. Captain Hall further explained that he had enlisted this Band in accordance with orders received from Lieutenant Colonel Burrows before leaving, "and having engaged them

at the same rate as the rest of our Musick," he would bring them back with him on the *Congress;* and that he hoped the Commandant would be "pleased with them."

Lieutenant-Colonel Commandant Wharton, of course, was unaware of the orders Captain Hall had received from his predecessor, and was anything but "pleased" to have a second "Band of Music" on his hands. On June 29, he wrote Captain Hall that he had "never given any order for the collection of a band in the Mediterranean," and informed the Captain that it could "not be mentioned as belonging to the Corps"; also that "the Secretary of the Navy can never consent to allow two Military Bands for one Corps, and the Private Fund, hitherto used, has been done away with."

When Captain Hall arrived in Washington, he was given an opportunity to explain his band-making proclivities. On May 13, the Secretary of the Navy, the Commandant and Captain Hall "went into conference" on the "subject of the Italian Musicians." As a result of this conference the Secretary wrote Commodore Rodgers in the Mediterranean, on May 15, 1806, that "Captain Hall of the Marine Corps, having while in the Mediterranean wthout competent authority but under" direction of Commodore Barron, "enlisted a number of musicians," and caused considerable inconvenience, this letter was being written with the hope that he would not fall "into a similar error."

The last heard of "Captain Hall's Band of Italians" was on July 31, 1806, when the Commandant ordered that the "Italian Band" live in "quarters within the garrison" and be "under the same regulations as the Old Band is and has been."

And so the Marine Band, highly appreciated and warmly commended, continued its informal existence for many years.

In 1845 the Brigadier-General Commandant made a strong plea for the Marine Band to the Secretary of the Navy, George Bancroft. But in spite of this, and subsequent recommendations, it was not until eleven years later that Congress took any specific notice of the Marine Band. On August 18, 1856, President Pierce approved legislation giving four dollars additional monthly pay to the members of the "Corps of Musicians known as the *Marine Band,* stationed at the Navy Yard in Washington City," to begin May 1, 1856. This law provided that the pay was "to

continue as long as they shall perform, by order of the Secretary of the Navy or other superior officer, on the Capitol Grounds or the President's Grounds." Finally on July 25, 1861, President Lincoln approved an Act of Congress that authorized the enlisting of One Principal Musician and "thirty Musicians for Band," in addition to the Drum Major, who had been authorized from the beginning of the Corps.

Thus, after an informal existence of more than sixty years, had recognition finally been accorded by Congress to the Marine Band—the famous "President's Own"—that has played for every president except George Washington.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

THE ART OF SHIP-CONTROL

COMMANDER W. C. I. STILES, U. S. NAVY

It seems characteristic of the state of ship-control in our Navy that the very name assigned to this branch of our profession was pinned on it by a group of ordnance experts, and was made to include everything in the battle activities of a vessel not directly connected with launching projectiles at the enemy. Thus, though a careful distinction is drawn between fire-control and torpedo-control; such diverse activities as the maintenance of water-tight integrity, the repair of structural damage, the operation of the ship's power plant and propelling machinery and the administration of first-aid treatment, are indiscriminately lumped with the actual management of the vessel under this all-embracing classification.

Strictly speaking, however, the name "Ship-Control" means exactly what the words indicate; that is, the operation of controlling the course and speed of the ship. It is distinguished from navigation in that navigation has to do with the geographical position of the ship, while ship-control concerns itself entirely with her position with reference to other vessels. It has to do, therefore, with tactics and turning circles rather than with astronomy and surveying. While navigation is a science, based on mathematical formulæ and geometrical constructions; ship-control is properly classed as an art, being based largely on judgment and the proper evaluation of conflicting and often intangible factors.

It is unfortunate that this basicly important feature of our profession has been allowed to develop as best it might without any organization under which advances might be consolidated and the necessary material developed in its most useful and convenient form. While the mechanical devices under the gunnery

and engineering departments have been brought to a high state of excellence under the supervision of officers experienced in their practical use, those employed in ship-control have been only slightly developed, and this almost entirely on the initiative of their civilian manufacturers. Even on our most modern ships the lay-out of our bridges seems to have been predicated more on an attempt to make the necessary gear fit into a space arbitrarily provided for it, than on an effort to arrange things in the most suitable and convenient manner.

With regard to the technique of ship-control, the same lack of a single source of supervision and authoritative information exists. Particular features of it are covered by widely separated authorities, but in general each of us is left to learn what he can by trial and error, frequently the latter. It is everybody's business and therefore nobody's business.

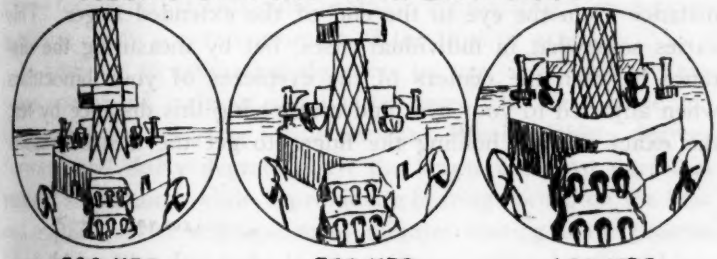
Success in this line of endeavor is popularly held to be dependent on the "nautical eye," a God-given instinct to do the right thing at the right time, which some of us are thought to have born in us and others not. In reality this nautical eye is simply an ability to judge distances and angles rapidly and fairly accurately, coupled with a knowledge of the factors affecting the turning of a ship and the judgment necessary to predict their combined effect. This ability is, as a matter of fact, often obtained by long experience and costly initial error; but in these days of restricted fuel expenditures it is particularly necessary for us to ground ourselves thoroughly in the underlying theory. Moreover, we should lose no opportunity to observe critically the maneuvers of our vessel by others, in order to avoid their mistakes and to profit by their experience.

Of course, the bridge of a ship at fleet maneuvers is no place for a gathering of spectators, particularly more-or-less garrulous ones. However, a great deal of value may be obtained by selecting a spot from which the movements of the steering gear may be observed. It is quite an interesting sport for a group of officers off watch to congregate in such a position to read the signals and to decide what they would do. Some valuable experience may be obtained by observing the slick of the next ahead as you approach the turning point and saying "Turn" when you think the instant has arrived for putting over the rudder. But noting

the difference between your judgment on this point and that of the Officer-of-the-Deck, and observing the results from his decision, you will rapidly acquire the faculty of guessing this matter correctly.

Another interesting amusement is to practice guessing distances by eye and to compare your results with those of the stadimeter. After a little practice at this art quite surprising results can be secured, particularly by making use of one or two little dodges. A common one is to observe the exact amount of your next ahead which is visible in the field of your binoculars when she is at exactly standard distance. By fixing this in your mind, a glance at her through your glasses will permit you to estimate her actual distance within a probable error of ten or twenty yards.

JUDGING DISTANCE WITH BINOCULARS.



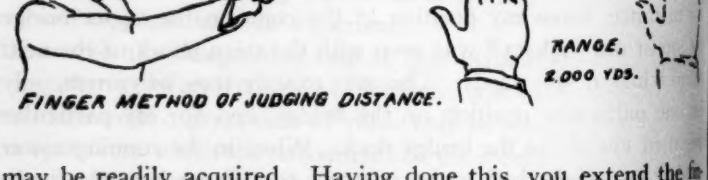
600 YDS. 500 YDS. 420 YDS.

A more convenient method on battleships is to line up the jackstaff of some point on the ship ahead. On my last ship, for instance, from my position at the conn on the upper bridge the top of our jackstaff was even with the stern chock of the next ahead when at 500 yards. This was exactly true, of course, only for one particular position on the bridge, and for my particular height of eye above the bridge deck. When in the conning tower another expedient had to be resorted to. From here the jackstaff was almost up to the horizon, and therefore could not be used with any accuracy. However, there were a series of insulators on the fore stay, and by getting the main truck of the next ahead midway between the third and fourth insulators, I could be assured that the distance was correct.

All of these indications, of course, grow inaccurate when the ship is pitching, but by splitting the apparent movement of the jackstaff workable results may still be obtained.

Visual acuity may also be made use of. On one ship which I followed for several thousand miles there were two air ports close together on each side near the stern which, to my eye, blended together at about 500 yards. At 480 yards they stared at me like a pair of eyes, while at 520 I could barely distinguish that there was more than one. This was but a chance applicable to my particular degree of eyesight, but it seems quite probable that in many cases some such indication could be discovered by close scrutiny. In this particular case the results were quite surprisingly accurate.

Another means of judging distance which is interesting and sometimes useful is by the finger method. It is based on the principle that the distance between the eyes is one-tenth of the distance from the eye to the end of the extended finger. This varies somewhat in individual cases, but by measuring the distance between the centers of the eyepieces of your binoculars when adjusted to your eyes and multiplying this distance by ten, the exact way of holding the finger to get the desired results



FINGER METHOD OF JUDGING DISTANCE.

may be readily acquired. Having done this, you extend the finger and align it with one eye on one end of an object of known length. Then quickly observe with the other eye without moving the finger, and note how many yards along the length of the object the finger appears to be displaced. The range of the object will be ten times this distance. If the object be a ship of known

length it will, of course, be necessary to make a mental correction to give the apparent length in a line perpendicular to the line of sight, unless you find yourself directly on her beam.

I had occasion to use this method once in maneuvering around a totally disabled ship with all lights out, when all other methods of rangefinding failed; and was able to tell at once that we were far enough from her to permit us to turn 180 degrees toward her without danger of collision.

A simple trick for estimating long ranges useful in high visibility is to be found from a glance at Bowditch's table for determining the distance of the sea horizon from any height. From a battleship's bridge this distance will be about eight and one-half miles. Therefore, if a similar ship is hull down until only the top of her bridge and upper works are visible, her distance will be seventeen miles. By a rough interpolation between these points a very fair estimate of her distance can be obtained; and I have found this wrinkle quite useful in approaching a rendezvous to give a fairly accurate estimate of the time of arrival.

In addition to estimating distances by eye, it is well to have some means of judging relative bearings with reasonable accuracy without resorting to the pelorus. Bearings thirty degrees forward and thirty degrees abaft the beams are most useful in tactical formations, while approximate bearings broad on the bow and on the quarter will save many minutes waiting at the pelorus when taking bow and beam bearings on navigational marks. Usually it is fairly simple to establish these bearings by lining up bridge stanchions and other fittings, and this knowledge will serve you well when a quick decision is required.

Another kink I have found useful is to take rapid relative bearings with a gyro pelorus by simply pointing the navigational rangefinder end on at the object, or by sighting through the rings of the mounting, and reading the scale on the outside of the pelorus bowl.

Judging our angle of bearing from another ship, or in other words, her course with reference to ours, is often a question of great importance, and one in which the unaided eye must frequently give the only answer. Here familiarity with the details of the ship observed will be of great value. From positions nearly ahead or astern the relation of her masts will give

the clearest indication, but from positions near the beam the boat cranes, even at long range, will frequently give results which compare quite favorably with those of the most elaborate plotting system. Moreover, the eye detects a change of course at once, whereas the plotting room only gradually becomes aware of it from its effects. Within, say 3,000 yards, it is often easy to keep abeam of another ship quite accurately by observing when her chart house windows are lined up so that you can see right through them.

In keeping distance in column in a compound formation it is frequently possible to predict and anticipate the fluctuations in speed by the division guide by observing our bearing from the corresponding ship of the guide division and estimating whether this ship is ahead or astern of her proper station. With battleships nearly 200 yards long and only 300 yards of open water between ships, it is not difficult to tell whether the guide division is opened out to any extent.

Success in making turns in formation rests primarily on a thorough knowledge of the ship's tactical data. This information is frequently kept securely hidden in the Navigator's files; and at that, is sometimes incomplete and inaccurate. It should, of course, be conveniently available to all officers, and should preferably be prepared in the form of easily visualized graphs rather than in impressive but obscure columns of figures. What is required on the part of the officers using it is not, of course a knowledge of the exact figures, but a practical ability to visualize the advance and transfer in any particular turn, to fix by eye the track ahead of the ship which she will follow when the rudder is put over a certain amount.

This ability is acquired first by a study of the turning curves and an analysis of the comparative effect of various rudder angles and the different methods of handling the engines. Secondly, it is perfected by critically observing actual performances, and particularly by finding an explanation for the discrepancies which will continually be observed between the ship's actual performance in a particular case and the theoretical performance deduced from the turning curves.

A common cause for an apparently excessive advance is to be found in the fact that the steersman will frequently give the

ship a slight sheer in a direction contrary to that of the turn just before the turning point is reached. The rudder used to make the turn proper will then be employed at first wholly in "meeting her," and the ship will be very sluggish in responding to it.

Another factor, frequently of marked importance in handling some of our battleships, is the reluctance of the ship to turn away from the wind, coupled with a tendency to turn rapidly toward it. This is due to the full, bulbous noses of our recent ships, as well as to the fact that their after deadwood is almost entirely cut away. This will be quite strikingly observed when the ship is in drydock. Her forefoot stays right down to the keel blocks until within a few feet of the point of her ram, while aft one may stand under her propellers and observe the spacious arch of her after-body overhead. The upshot is that her stern is free to drift off to leeward with little resistance while her bow is firmly anchored in the water. This effect is counteracted to some extent by the fact that the bow is higher above water than the stern, but the tendency is still generally for the stern to resist swinging toward the wind.

It is important also to get a clear practical idea of the retardation data, that is, how long the ship carries her way under various circumstances. A consideration of the figures in the tables will form a good basis for judgment, but allowance must always be made for the retardation due to the use of the rudder in cases where a turn is to be made.

For instance, when joining up astern of another ship at full speed it will be necessary to press her rather closely and to keep full speed on until the final turn is almost completed, if approaching at an angle of sixty degrees or more from her course. Otherwise the retardation of the final turn will more than compensate for the increased revolutions, and the ship will drop astern considerably before any correction can become effective.

Sometimes this feature may be used deliberately to drop back, but this is generally considered bad practice and is, moreover, difficult to accomplish without throwing the ship off her course. A practical case which frequently occurs is when the ships are approaching anchorage, and have stopped their engines preparatory to anchoring on signal. If your ship holds her headway

longer than the leader you will jamb up on her unless something is done about it. Backing is likely to throw a scare into the ships astern, but by freely using the rudder in large amounts while she still has steerageway you may be able to kill her speed sufficiently to keep your position. The effect of the use of the rudder in such cases is almost immediate, whereas a change in the engine revolutions, unless a drastic one, will not produce a noticeable effect for several minutes. Such an expedient should not be resorted to without any consideration for your next astern, as she will have no means of knowing what you are doing, and may pile up on you in a manner perfectly incomprehensible to her officers.

The old-fashioned idea of ship maneuvering was to allow of no variation from the precise mode of procedure prescribed in the instructions governing the case. The theory was that one should determine in advance the exact instant of starting the maneuver and then proceed along invariable lines, putting his rudder over a certain standard amount and easing it at a predetermined point regardless of the results. If his initial guess could accurately forecast all the factors which would influence his ship before the maneuver was entirely completed he would come out at the right place; if not, as was most frequently the case, he was simply "out of luck." This conception of maneuvering should of course always obtain on board the guide ship, in order that the others may have a definite standard to conform to; but it is believed that, with regard to the other ships, a more modern conception is that the primary duty of the Officer-of-the-Deck is to exert all his faculties to keeping his ship at all times in position, and that he should use his judgment not only in commencing the maneuver but in seeing it through to a successful completion. In fact the "Art of Ship Control" is believed to rest largely in the proper use of his judgment. The latitude allowed in such cases, is, of course, strictly limited by a consideration of the effects of your variations from the strict procedure on the maneuvering of the other ships, particularly of the next astern; but you cannot afford to surrender all control over the outcome of the maneuver immediately on giving the order "Right standard half rudder."

Much has been written on when to start a turn in column

formation, but little on how to finish it; and it is your final position which decides whether you get a "Well done" or a position pennant on it. It is now not only a general custom but almost a necessity to steer the ship around in the wake of her next ahead, and any ship handler who undertook to do otherwise would come to grief nine times out of ten. Many factors enter into this game—the state of the wind and sea, your condition of trim and the probable shifts of rudder by your next ahead. You can generally tell if she uses more than usual rudder angle by the way her wake boils up under her stern. By this indication, and by observing whether she appears to start turning inside or outside, you can generally get a fair idea of your probable procedure. Having, let us say, started your turn properly with your bow about half the ship's beam inside of her wake, you must watch her wake intently and at the first indication that your bow is getting closer to it give her more rudder. This can be readily observed by noting where the band of white water appears to cross your jackstaff. If it shows a tendency to creep downward, soak her with more rudder; if it rises, ease the helm quickly before you get inside.

When within three or four points of the finish of the turn it is well to direct your attention to the aspect of the ships ahead. Sometimes by easing the rudder you can make her slide easily into position, again it will be necessary to swing her hard and fast. In this latter case there is considerable danger that you may swing past and botch the job. It is well to swing her rapidly at first, and then ease up when you have the situation well in hand. In extreme cases you must hold your turn with hard over rudder and meet her hard at the last moment. This, of course, is bad practice, and may reduce your speed enough to get you into difficulties with your next astern. Unless you were well closed up at the beginning of the turn it may be best to let her go outside deliberately and run up to the position pennant.

This last example calls attention to another little trick in ship handling. If you find yourself behind your proper position in column when a turn is made, turn early and with easy rudder and you will catch up, whereas if you were a trifle too close it may be well to hold on until the last minute and then give her all you've got. The effect of this latter procedure in a turn as

large as ninety degrees is frequently pronounced, and it is perfectly possible to overdo it. There is also a constant danger that you may delay too long and be forced to turn outside, so that it is necessary to be sure of your ground and to use plenty of discretion in attempting this procedure.

In making simultaneous turns with the guide, everything depends on your getting started together. If you do not you will most certainly end up off the correct line of bearing; but by the time the bearing of the guide has changed appreciably, to give you an indication as to which way you are going to come out, it will be too late to apply the remedy effectively. The solution lies in closely watching the masts or cranes of the guide when the maneuver is started. If they commence to move off from each other before your own ship has started to swing, it will be necessary to put on more rudder until you think you have caught up with her.

In the rapid succession of simultaneous turns so much used in modern tactics it is frequently possible to adjust your position to advantage by introducing little variations of your own into the maneuver. For instance, if you are behind your station and the signal calls for a 45-90-45 combination you can readily catch up by making it a 40-80-40 evolution as far as your ship is concerned. By so doing you will have saved twenty degrees of turning, and your course will have been always slightly more in the direction of the advance of the fleet than that of your division mates. Also, since you were probably going at more than standard speed at the time the evolution was signaled you will probably have preserved your correct bearing throughout the maneuver.

Similarly in one of these combinations, one turn may be doctored to undo the error made on the previous one. For instance, suppose that in the previous example you had finished the first forty-five degree turn behind your proper bearing. If you make the ninety degree turn in a regulation manner you will then be ahead of your position. What you must do is to make the first part of the ninety degree turn slowly with easy rudder, and then jamb her over at the finish. It is well to have an observer at the gyro pelorus singing out constant bearing of the division

guide during the turn. Otherwise you are quite likely to overdo the correction.

When steaming on a line of bearing I have found it a great convenience to use the Battenburg Course Indicator as a plotting board. The system of parallel lines is set to the course, and one of the position bars is adjusted to indicate the correct bearing and distance from the guide, while the other is set for the actual bearing and distance at the moment. In this way you can tell at a glance, for instance, that you must bring your ship fifty yards toward the guide and draw ahead seventy-five yards and it is almost impossible to get balled up and do the wrong thing.

The Battenburg is also an excellent help in movements involving change of bearing. Of course, the course and speed necessary are now given you in the tables, but by using it simply as a plotting board to show your distance from your proper position and the speed with which you are approachng it, you have something better than guesswork on which to base your decision as to when to go to standard speed. It will generally be found in these evolutions that it is necessary to turn up on the final course some little time in advance of the time that you get to your proper bearing. The position in which the ship plots with reference to the line passing through the final position will enable you to start this turn at the correct time.

We found the Battenburg so useful as a plotting board that we had it habitually mounted on a shelf directly in front of the Officer-of-the-Deck, though it was seldom used to determine the course to steer in any fleet evolution. For special problems, after experimenting considerably with Course Indicators, Mooring Boards and various homemade contrivances, I have personally reached the conclusion that the best results are obtained with the Universal Drafting Machine. By mounting this conveniently on the bridge, using a plain piece of chart paper with a thumb tack inserted point up through its reverse side, and filing a notch at the zero point of the drafting machine scale, you have a means of rapidly laying off bearings and distances, and drawing parallel lines; and, if you know how to go about it, you can solve any problem. Moreover, you are not confused by an elaborate system of lines already on the chart; and the same lay-out, with the

anchorage chart substituted for the plain paper, will be most convenient in finding your way to your proper berth when the day's work is done.

Maneuvering from the conning tower involves additional complications, and one of the first ones encountered is the question "Whose job is it?" The Captain sometimes feels that with the increased difficulties to be encountered and the lack of all-round vision, it is a matter that should receive his personal attention. If this takes place the Captain becomes thoroughly occupied with the duty of keeping the ship 500 yards from the next ahead. He can spare no time to observe the enemy, or to direct the fire of his ship to the proper target; and these duties automatically devolve on the Navigator. Their true rôles are thus reversed—the Navigator fights the battle and the Captain conns the ship. Of course this situation obtains only at maneuvers, where the practical handling of the vessel is a matter of much more pressing importance than the engagement with an altogether imaginary enemy. Nevertheless it would appear that such a situation is an artificiality directly at variance with the requirements of war conditions.

The principal difficulty experienced in the conning tower is due to the lack of free vision, producing a sense of insecurity which, however, gradually wears off with time. The generally inconvenient location of the instruments, and their frequent inadequacy, are other difficulties which might be removed by attention to the details of design and of layout. With characteristic disregard for the primary function of the conning tower, there were recently installed in our battleships a couple of extra-loud radio buzzers which rendered verbal communication impossible. The reason for this appears to have been that the chatter of the Captain disturbed the third-class radioman, and it was therefore decided to drown him out.

This brings me back to the lay-out and general arrangement of ship-control gear, which generally leaves much to be desired. A turret officer has his instruments and communications disposed about him where he can see them all without turning his head and reach them all without altering his position. In the engine room the gauges and controls are brought to a central point from which

the condition of the entire operating plant may be seen at a glance. On the bridge, however, the Captain of the ship, in most cases, must habitually crane his neck to read the rudder angle indicator, and requires assistance in even such a simple piece of work as stopping both engines.

The officer conning the ship at maneuvers wants a fairly unobstructed vision from ahead to about thirty degrees abaft the beam. It would be well to have him so located that it will be difficult for a messenger to pester him on trivial subjects, and the ship's organization should be such that he is relieved from these distractions. He cannot steer the ship himself; but he can, and should personally operate the engine telegraphs and the revolution transmitters, as well as the whistle and siren. He should have under his eye a gyro compass, by means of which he can check the course, a rudder angle indicator from which he can observe the actions of the steersman, and a reliable means of knowing just what speed the engines are actually making. He should have on his compass a means for taking bearings, both gyro and relative; though normally he will depend on an assistant for this information. He should have his signal book on a convenient shelf before his eyes, and beside him a rack for the Battenburg Course Indicator, on which the actual and required positions may be plotted, either by himself or by an assistant. If a chart board can be installed alongside him so that he can personally observe the plotting, he will then be able to have a personal supervision over all the elements of his job without leaving his conning station. He will ordinarily find it more convenient to ring up a change of speed on the engine telegraph himself than to give the order to a partially trained, second-class seaman and then watch him carry it out. However, when coming alongside anything, he may very easily shift his position to the wing of the bridge and have a junior officer or a well-trained quartermaster handle all the instruments for him. The old idea that a man must necessarily be uncomfortable to be efficient has now happily passed away. Thus, there would seem to be no real objection to having a seat for him. There would then never be the slightest doubt as to just who had the deck. When relieved he would not only turn over his job, but would also abdicate the throne.

Greater attention might also be paid to providing convenient

locations for the various assistants required in maneuvers, from which the reports may be received by the officer at the conn without the necessity of a lot of loud singing-out and confusion. It is a very well-known fact that on a bridge where there is a chronic uproar it is but seldom that the maneuvers are smartly carried out. Reports of bearings and distances fly thick and fast, each man trying to outdo the other in rapidity and volume; the man at the wheel gets jumpy and nervous; and the officer at the conn is distracted and rendered incapable of exercising his best judgment. The whole effect is that a frightful emergency is about to take place, and as like as not this feeling will be justified by the results.

It appears that the reason for the unsatisfactory state of ship-control matériel is not that the matter is overlooked, but that it is considered by a great number of specialists;—but specialists in other lines. The lay-out of bridges of new ships is referred to ordnance experts, engineering experts and strategical experts. Such a variety of opinion is obtained that the final result is always an attempt to reconcile divergent viewpoints, and pleases nobody,—least of all the persons who will have to use it. The design of bridge instruments is entrusted to electrical engineers, who can do little more than to reproduce the same old devices in slightly improved form. The electrical telegraph, for instance, is made to look exactly like the older mechanical telegraph, though an instrument similar to the smoke telegraph would do the same work, and two might be mounted in the same case. The saving in space in our conning towers which could be realized by mounting all the instruments and controls compactly on a single panel would be considerable, and the increased ease of operation would be an even greater advantage.

We must conclude from these conditions that we ourselves are considerably to blame. The shore people will give us what we want, provided that we express our wants loudly and frequently enough. Ship-control is somewhat of a specialty, though an unrecognized one, and if those of us who are experienced in this line will evolve and advocate constructive ideas, instead of conceiving our entire duty to be to do the best we can with the gear furnished for our use, we will eventually succeed in getting the material best suited to our special requirements.

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THE ORIGIN OF WATERTIGHT COMPARTMENTS

By Captain Elliot Snow (CC), U. S. Navy

Two hundred years before Columbus discovered America, in 1292 to be exact, Marco Polo and two of his Venetian companions set sail from a Chinese port with a splendid squadron of ships which had been furnished and outfitted by Kublai Khan. The *Travels of Marco Polo,* which record the events of this and his other travels, contains the following early history of the subdivision of vessels into watertight compartments:

We shall commence with a description of the ships employed by the Indian merchants which are built of fir timber.[1] The vessels are provided with a good helm, have four masts with as many sails, ... have a single deck, and below this space is divided into about sixty small cabins . . . . Some of the ships of the larger class, have, besides the cabins, *thirteen bulkheads or divisions of the hold.* These are formed of thick planks let into each other (i. e. mortised or rabbeted). The object of these is to provide security against accidents which may occasion the vessel to spring a leak such as striking a rock *or receiving a stroke from a whale,* a circumstance which not infrequently occurs. When sailing at night the motion through the waves causes a white foam around the bow that attracts the notice of the hungry animal. In expectation of meeting with food, it rushes violently to the spot, strikes the ship and often forces in some part of the bottom . . . . The crew upon discovering the situation of the leak immediately remove the goods from the *division* affected by the water, which, in consequence of the boards being so well fitted, cannot pass from one division to another. . . . The ships are all double planked, that is they have a course of sheathing boards laid over the planking in every part. These are calked with oakum both within side and without, and are fastened with iron nails. They are not coated with pitch . . . . but the bottoms are smeared with the following

[1] As there is no fir timber in India, there is therefore good reason to conclude that the ships described were built in China. This country is accordingly the one that, as far as we know, may legitimately lay claim to having originated the idea of the watertight subdivision of vessels.

preparation. The people take quicklime and hemp, which latter they cut small, and with these when pounded together they mix oil procured from a certain tree, making the whole an unguent which retains its viscous properties more firmly and is a better material than pitch.[2]

This fact that the Chinese, as early as the thirteenth century, resorted to watertight subdivision of their vessels did not escape the attention of Dr. Benjamin Franklin. He mentioned it thus, in a letter written in August, 1785, to Alphonsus Le Roy then in Paris:

> While on the topic of sinking of ships, one cannot help recollecting the well-known practice of the Chinese, to divide the hold of a great ship into a number of separate chambers by partitions, tight caulked, so that if a leak should spring in one of them the others are not affected by it.... *We have not initiated this practice.*

A little farther on in this same letter, Dr. Franklin states that there are six kinds of accidents that may occasion the loss of ships at sea: two kinds of these involve the foundering of a vessel from collision with ice or with another vessel. As a precaution against these he suggests in the following words the use of empty water casks.

> And as to the water casks mentioned above, since a quantity of them must be in great *ships of war* where the number of men consume a great deal of water every day, *if it had been made a constant rule to bring them up as fast as they were emptied and to dispose of the casks in proper situations,* I am persuaded that many ships sunk in engagements or that have gone down afterwards might, with the unhappy people, have been saved.

This idea can without a great stretch of imagination be considered a forerunner of the scheme later devised in France by Mr. Emil Bertin. This was to provide cofferdams at the ships' sides filled with some kind of light packing material. At first cocoanut husk and its surrounding cellulose were used for this purpose. This was later supplanted, in the United States Navy by corn pith cellulose.

If one likens a submarine to a whale and bears in mind that the former, like the latter, is attracted to its prey by the motion of

[2] This method of preserving the bottom of their vessels is common to the Chinese and the East Indians. It is said that the use of a coating made from a mixture of chunam or lime, with resinous oil or with melted damar, will make a vessel last one hundred years.

the vessel through the water[3], and that in both cases safety against the attacks delivered by these "leviathans of the deep" is greatly increased by adequate watertight subdivisions, one may well believe

> The thing that has been, it is that which shall be; and that which is done is that which shall be done; and there is no new thing under the sun.[4]

[3] A submarine totally submerged is, however, attracted to its quarry through hearing and not by sight as described in the case of the whale.
[4] Ecclesiastes 1:9.

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A YEAR IN HAITI'S CUSTOMS AND FISCAL SERVICE

By Captain Charles Conard (SC), U. S. N.

Those who pass their lives in a service such as the Navy are accustomed ordinarily to find their current work a development of preceding efforts, and thus to move forward in a steady line of progress, improving the year's output as far as possible by the experience gained in more or less similar work of the past. Occasionally, however, there comes a period of violent change, when one is plunged into an entirely new environment, and his hand is set to a work entirely outside his range of experience. He is fortunate if the new task is one which suits his temperament and habits of thought, and somewhat to be pitied if it does not. In either case, he is apt to have a somewhat strenuous time.

There follows a brief outline of a period of the nature indicated, lasting a little more than one year. No attempt will be made to furnish a complete or continuous record, but certain features which are thought to be of interest will be described.

Toward the middle of August, 1915, eleven officers of the Navy, all belonging to the Supply Corps (Or Pay Corps, as it was then called), received telegraphic orders to proceed to Philadelphia immediately and report on board the U. S. S. *Tennessee*. These orders had been transmitted in code, and were to be held as confidential. Nothing was said as to the nature of the duty to be performed, but as the press had contained news of trouble in Haiti, and as occupation of the ports of that country by the U. S. Government had been predicted, there was ground for belief that this had something to do with the matter, especially as it was known that a force of Marines had also been ordered to the *Tennessee* for transportation to Haiti.

I was one of those who had received such orders. It was known that the Customs Service of Haiti would have to be taken over, and it seemed reasonable to conclude that my orders related to that project, as previous experience along the same lines, in Vera Cruz, Mexico, had fallen to my lot.

The other ten officers concerned reached Philadelphia, and with but few exceptions each was under the impression that he had been ordered to relieve the Paymaster of the *Tennessee*, though some surprise was felt in regard to the unusual nature of the orders, especially as some were on leave at the time the orders reached them, and others felt reasonably sure that they were not due for sea duty. The matter in hand was explained to them only after they had reported aboard ship.

At that time there was a good deal of discussion of accounting in the Navy, and press representatives who inquired of the Executive Officer of the *Tennessee* why so many Paymasters had been ordered to one ship, were gravely informed that the Navy's new accounting system required that many.

There are ten seaports in Haiti having custom houses, and for this reason Admiral Caperton, commanding the naval forces in Haitian waters, had requested the Navy Department to send eleven Pay Officers, one for each port, and one to act as administrator of the whole service.

Owing to my long and varied career of about seven months of Custom's service in Vera Cruz, it was my business to instruct the others of the party in the details of the work to be undertaken. None of the others had had any experience in Customs affairs, other than in paying duties when returning from foreign service—or in finding ways for not paying them. However, during the passage down we went over the situation, as far as our somewhat meager information permitted, and settled certain fundamental lines to be followed, pending the working out of a complete scheme.

We reached Port-au-Prince, the capital and chief port of Haiti on August 31, 1915.

Prior to our arrival the ports of Cape Haitien, Port-de-Paix, Gonaives and Saint Marc had been occupied, and the custom houses placed in charge of officers attached to vessels of the Cruiser Force. As this was at a sacrifice of the efficiency of the

vessels concerned, it was desirable to relieve these officers as promptly as possible. Immediately after arrival I was appointed Administrator of Customs, relieving Paymaster Charles Morris who was acting in that capacity temporarily in addition to his duties as Pay Officer of the Flagship.

As the *Tennessee* left Port-au-Prince on the day of her arrival, bound for Cape Haitien, it was decided to send two officers by her to take charge of the Custom Houses at Cape Haitien and Port-de-Paix. Paymaster W. L. F. Simonpietri was appointed as Collector of Customs and Captain of the Port at the former, and P. A. Paymaster Smith Hempstone at the latter port, and they proceeded as indicated above. As there had been very little time for instructions to the officers, they were told to depend largely upon their initiative, and in case of doubt to submit difficulties by wireless.

Up to this time possession had not been taken of the customs house at Port-au-Prince, such action having been delayed in consideration of the effect it might have on the negotiations then being conducted by the American Chargê d'Affaires with the Haitian Government, for the conclusion of a convention covering the custom's control and financial reorganization of the Haitian Government. It was now decided by Admiral Caperton to take possession of the Port-au-Prince Customs House, as a measure to bring additional pressure to bear in connection with the treaty negotiations; also in view of the expected arrival of several merchant vessels at this port, and the desirability of collecting the duties on their cargoes; and because it was realized that the Customs administration could not be properly organized until this, the largest customs house was in our hands. Therefore, on September 2, 1915, the customs house at Port-au-Prince was taken over and put in charge of Paymaster H. E. Stevens, U. S. N., who was appointed Collector of Customs at this port. Lieutenant Commander Willis McDowell, U. S. N., was immediately thereafter appointed Captain of the Port, later turning this duty over to Paymaster Stevens.

The occupation of the Port-au-Prince Customs House was carried out without resistance on the part of the Haitians, this being also true of the custom houses previously taken over. All employees, however, with the exception of one or two, refused to

continue on duty, under instructions, it was understood, of the Minister of Finance. Consequently it was necessary to organize a new force at once, in order to proceed with the clearing of merchandise, both export and import.

A force was gradually gotten together, some of the recent employees returning, and some who had been in the Custom service in previous administrations were secured.

The Collector of Customs, as soon as the work of clearing vessels was underway, began the task of cleaning up the offices and storehouses, and this work was completed satisfactorily.

On September 4, P. A. Paymaster M. H. Philbrick was appointed Collector of Customs at Jeremie, and reported aboard the U. S. S. *Marietta* to accompany the expedition sent out to capture that place and take over the customs house. This was accomplished the succeeding day without opposition.

On September 5, P. A. Paymaster A. G. Hearne and Assistant Paymaster F. C. Bowerfind were appointed as Collectors of Customs[1] at Gonavies and St. Marc respectively, and left to relieve the officers who had been temporarily detailed at those places. All these officers, having had the advantage of observing the methods of business employed at Port-au-Prince, were in better position to take over and administer the duties at their respective ports than in the case of the two officers first sent out.

On September 6, P. A. Paymaster F. E. McMillan, and P. A. Paymaster H. R. Snyder, left for Petit Goave and Miragoane, at which places they were appointed Collectors of Customs in the order named.

On September 12, P. A. Paymaster E. H. Van Patten, and P. S. Paymaster B. D. Rogers, reported aboard the U. S. S. *Sacramento*, having been appointed Collectors of Customs at Jacmel and Les Cayes, respectively, to take office upon the acquisition by the U. S. Forces of those ports. Les Cayes was occupied on September 15, without opposition. Jacmel was occupied two days later.

In planning our system for obtaining a proper grasp of the Haitian Custom Service we proceeded on the basis that every merchant vessel must carry a manifest, on which her cargo must

[1] For brevity, the title "Collector of Customs" will be held to include that of "Captain of the Port," in the following pages.

be listed, each bill of lading being separately entered. Further, each bill of lading must give a general idea of the merchandise involved, with weights and numbers of packages. In addition, for incoming cargoes, invoices from the country of origin must be produced, showing exact descriptions and values of the goods. Most countries require these invoices to be certified to by the Consular representatives abroad, the invoices then being called "Consular Invoices."

Importers and Exporters must also furnish sworn declarations relating to the goods in movement, and there are usually heavy penalties for false declarations.

Each country has published tariffs covering rates of duties on imports and (excepting the United States, for one), exports. Also there are various tonnage, harbor and health duties, according to local conditions.

So much was known before entering upon our task. We found, as had been expected, that the Customs laws of Haiti were obtainable in printed form, being embodied in a small volume entitled *Loi sur les Douanes de la République* and fluent French scholars will have no difficulty in translating this as the "Custom House Law of the Republic." This volume also contained the tariff schedules. It is true that these publications were very scarce, and no copies were found in some of the custom houses. After much trouble they were secured later and distributed to all ports.

One of the first steps taken was to radio the Navy Department, requesting immediate shipment of one dozen French-English dictionaries, and one dozen typewriters. Upon the receipt of these we felt ready to handle any emergency.

The methods adopted for transacting Custom House business were those which the *Loi sur les Douanes de la République* provided, so far as the instructions contained therein did not conflict with the interest of the United States, or were not otherwise objectionable.

It was considered that at first no material changes of methods should be made, although where it was found that the provisions of the law above mentioned had not been strictly enforced, variations of procedure with a view to such enforcement should be made.

In this connection it was found that in the ports first taken over receipts were being paid in cash to the Collector of Customs, who daily deposited such cash in the National Bank of the Republic of Haiti. The law to which reference has been made prescribed that payments should be deposited in the National Bank by the payers, who then exhibited their receipts to the Collector of Customs for the proper clearance of goods and vessels. As this method provided a double receipt, one by the bank and one by the Collector, it had obvious advantages. Instructions were therefore issued that the legal methods should be followed throughout the service.

It was found that the business of the customs service as administered by the Haitian authorities was conducted in a manner which did not accord with the modern ideas of efficiency in many respects. Blank forms for the preparation of documents were practically non-existent, and all papers were prepared in handwriting on blank sheets. Fixed salaries of the clerical force were nominal, but fees were exacted from merchants for the preparation of clearance papers, etc. This resulted in favoritism in certain cases and made the work of receiving and shipping goods slow and cumbersome.

Printed forms for making declarations, and subsidiary papers, were supplied, and formal methods for recording and checking receipts and expenditures of cash were instituted. All fees were abolished, and salaries placed upon a reasonable basis. At each port the Collector of Customs prepared and forwarded to the Administrator of Customs a salary list, which was gone over carefully, and a uniform scale was finally adopted covering similar positions and duties in the several ports. Under instructions received from the State and Navy Departments, disbursements of customs revenues (aside from sums turned over to or expended directly for the Haitian Government), were restricted to four general purposes, as follows:

"For the organization and maintenance of an efficient constabulary.

"For conducting such temporary public works as will afford an immediate relief through employment for the starving populace and discharged soldiers.

"For the maintenance of such military and civil government as the United States may establish.

"For the expense of maintaining the customs service, including Captain of the Ports' Offices."

Through a series of laws and concessions of prior years the bulk of the custom's receipts were pledged for the payment of interest and principal on borrowings of the republic, or as guarantees for the fulfillment of contracts. It was necessary to disregard this state of affairs for the time being, in order to carry out the purposes of the military administration undertaken by the United States.

In order to meet the objections of the Haitian Government on the one hand, and of the National Bank of Haiti on the other, it was decided to administer all moneys received as a trust fund, for which purpose an account was opened in the bank entitled "Admiral Caperton Account." It was thus practicable to avoid interference with both Government and bank regulations relative to the handling of customs receipts, and to utilize the funds in the manner best fitted to meet the demands of the country during the period of re-establishment succeeding the recent revolution.

However, the National Bank, which by law was charged with the duty of segregating the items of receipt and expenditure in accordance with the liens, or "affectations" as they were called, was directed to maintain the accounts in such a way as to permit final adjustment to the satisfaction of all parties concerned. These accounts were checked regularly by the Administrator of Customs, and balanced with the records under the "Admiral Caperton Account."

The expenditures made for the account of the United States authorities were subdivided in the following manner, in order to give as clear an exposition as possible of the uses to which these funds were put. This subdivision also furnishes a general idea of the activities carried on at the time in question.

CONSTABULARY:

A—Pay of officers and men.

B—Pay—Civil—including clerks and interpreters.

C—Barracks—construction, repair, rent, etc.

D—Equipment—Uniforms, horses, saddles, typewriters, office furniture, etc., including repairs to.

E—Police—Pay and equipment of.

F—Miscellaneous—Office and other minor expenses not otherwise classified.

PUBLIC WORKS:

G—Streets and roads—Cleaning and construction of.

H—Harbor improvement—Dredging, construction and repair of wharves and docks.

I—Hydraulic work—Maintenance and construction of pipe lines, water supply, sewerage system, etc.

J—Public Institutions—Construction and repair of.

K—Miscellaneous—Office and minor expenses not otherwise classified.

MILITARY AND CIVIL GOVERNMENT:

L—Prison expenses—Clothing, rations, medicines and medical attendance of prisoners. Minor repairs to jail.

M—Relief of poor and hospital expenses. Maintenance and equipment of hospitals including rations for sick. Such donations for relief of poor as may be authorized by the Detachment Commander.

N—Sanitary—Such expenses and work as may be authorized for purely sanitary reasons not to include street cleaning.

O—Clerical force including interpreters, pay of.

P—Purchase of rifles and payment of Haitian soldiers.

Q—General expense—Office and minor expenses not otherwise classified.

CUSTOM SERVICE:

R—Clerks, watchmen, inspectors, etc.

S—Pilotage, sanitary inspections.

T—Repairs and improvements—Minor repairs to docks and custom houses including repairs to office furniture and equipment.

U—General expense—Office and other minor expenses not otherwise classified.

V—Captain of the Port.

In addition to disbursements of the character just mentioned, the Commander, Cruiser Force was directed to turn over to the Haitian Government a weekly allowance for the expenses of maintaining that Government. This was at first fixed at $25,000 per week, and was duly paid for several weeks. It developed, however, that the sums so turned over, instead of being used for current running expenses, were diverted for the purpose of liquidating certain obligations which the officials of the Haitian Government deemed pressing. Consequently, the State Department in Washington decided to modify its instructions, and

directed that, commencing with January 1, 1916, all salaries and expenses of every nature, pertaining to the Haitian Government, should be paid directly by representatives of Admiral Caperton to the employees concerned, in all ports of the republic.

This necessitated immediate preparation and institution of a system of financial control of the affairs of the Haitian Government, and the development of methods by which funds could be placed directly in the hands of those entitled to payment. A practice of discounting pay receipts had long been prevalent in the country, and in a great number of cases it had transpired that employees at a distance from the Capital actually received but a small percentage of the amounts due them. The discounted pay receipts, or *feuilles* as they were called, passed from hand to hand, each holder realizing a portion of the face value, until final liquidation was made by the Treasury in favor of the last holder. In order to break up this practice a form of non-negotiable receipt was devised, and the individual to whom the payment was due was required to draw the amount in person.

To accomplish this, it was necessary for representatives of the Admiral to visit every town and hamlet of the republic each month, carrying the funds to be paid with them. A happy solution of the problem consisted in utilizing the services of the officers of the Gendarmerie (as the constabulary was called) who, being officers and high ranking enlisted men of the Marine Corps, detailed to the Gendarmerie, were especially well fitted to carry out their part of the task.

For all payments to be made in the principal ports, where branches of the National Bank were established, it was directed that the payees must present themselves in person, sign the receipts and obtain the money. For the payment of salaries, pay rolls were prepared each month in the Administrator of Customs' office at Port-au-Prince, from the records of the Haitian Government. Each governmental department submitted lists of the employees coming under its cognizance both in the Capital and elsewhere. The lists were gone over carefully, and all duplications, erroneous entries, etc., eliminated as far as possible. In the outlying districts the Gendarmerie officers investigated and reported upon the actual conditions of employment existing, whether or not the persons named in the pay rolls were rendering

the services specified, and if not, who were rendering them. All doubtful cases were referred to the central office, and after thorough investigation the rolls were corrected when necessary and payments made to the proper claimants.

The general method of handling funds consisted in depositing to the "Admiral Caperton Account" all receipts from customs revenues, without deducting for any expenses. At each port the receipts were paid in to the branch of the National Bank, and three times each month the Collector of Customs reported by radio or telegraphed—whichever was most practicable at the time—the amount of the collections, using the Navy Radio Code and a prescribed order of wording. Each month the branch bank reported to the parent bank in Port-au-Prince the deposits from customs, using the private bank code, the messages being transmitted by the Navy's radio whenever possible. These two independent sources of information were, after de-coding, compared. Differences were frequently found, but all were reconciled after correspondence, being usually due to various constructions of the Customs laws, particularly in regard to advance or partial payments of duties.

For all expenditures to be made, estimates were forwarded from the various ports, by telegraph or radio, followed by detailed letters of explanation. The appropriate sums were then placed to the credit of the various Collectors of Customs, in the branch banks, and disbursed upon properly authorized vouchers submitted by detachment commanders and others in charge of the work being carried on by the United States authorities. Expenditures for the account of the Haitian Government, such as salaries, etc., were controlled directly by the Administrator of Customs, acting as Fiscal Officer. The Gendarmerie officers, who acted as disbursing representatives in this case, received the pay rolls, with prepared receipts and funds, and saw to it that the money was delivered into the rightful hands. All undelivered amounts with unused receipts, were returned to Port-au-Prince, from which it will be seen that the plan for paying employees was extremely simple. The actual execution of it, however, involved much investigation and labor, including long trips into the interior to locate and pay the recipients, who had to be thoroughly identified before payment could be made. The work

was admirably done by these officers, and it is safe to say the system of discounting *feuilles* was effectually abolished.

In general, from the above, it will be noted that all Customs receipts were paid in gross to the "Admiral Caperton Account" with no deductions for expenses of any kind. Sums for necessary expenditures were then separately allotted, after estimates had been finally approved by the Commander Cruiser Force. The keeping separate of the receipt account from all expenditures, instead of taking up net balances only, is belived to have tended strongly toward efficiency and accuracy.

One of the most important reforms accomplished under the American Navy's control of Haitian finances was the stabilization of the rate of exchange between the local currency, or "gourdes," and the United States currency. The Haitian currency consisted entirely of paper and nickel, without gold backing of any kind. It circulated purely as a medium of exchange, based on the credit of the Haitian Government. The real standard of value was the United States dollar, all export duties being payable in United States currency, and a large proportion of import duties also. The rate of exchange between the two currencies was accustomed to fluctuate between two or three gourdes for a dollar, and eight or nine gourdes for a dollar, depending upon the demand for Haitian currency at various seasons of the year. Thus, ordinarily, when the coffee crop was being gathered, gourdes were paid out into the country districts, were hoarded by the country people, and became scarce. The result was that at that time an American dollar could buy only two or three gourdes. Later, the hoarded gourdes would be spent by the country people, would flow back to the ports, and the available quantity having increased, the gourdes would fall in value, so that the American dollar would buy eight or nine gourdes. This fluctuation in exchange was more or less aided and abetted by speculators, who manipulated the market to their own advantage. It was extremely bad for business, as the ordinary merchant, who based the value of his goods entirely on U. S. Currency, but who was compelled to set prices in gourdes, could never be sure what gourdes would be worth from day to day.

A study of this situation was made, and it was concluded that the fair value of a gourde was twenty cents, approximately the

same as a franc. It was decided to fix the gourde at this value, and this was accomplished in three ways:

(1) By making all payments on Government Account in gourdes or "gold" (as U. S. Currency was denominated) at the fixed ratio, using whichever currency was considered to have the best effect on the market at the time.

(2) By causing the National Bank to exchange gourdes for gold, or vice versa, upon demand, using the accumulated custom receipts (Admiral Caperton Account) for this purpose. Such accumulated funds contained both currencies, as duties were payable partly in gourdes and partly in United States currency. It was, of course, necessary to restrict this exchange (at fixed rate of five to one) to actual business demands, so as to guard against speculative attempts to break the rate.

(3) By buying or selling gourdes in the open market, depending upon the direction in which the exchange rate was tending. Thus, if gourdes showed a tendency to depreciate in value from the five to one standard, purchase was made of a sufficient amount to slightly reduce the volume of gourdes in circulation. The purchased gourdes were retained in the bank and an equivalent value of gold (U. S. Currency) was placed in circulation. If the rate varied in the other direction, the reverse process was used.

An unexpected situation seriously hampered this plan for a time, and illustrated the effect of international events on the domestic currency problems of a small country like Haiti. Inability to secure dyes from Germany caused a heavy demand for the raw materials for the manufacture of dyes in the United States. Logwood, which had hitherto been one of the minor exports from Haiti, suddenly sprang into prominence as a valuable product, and all Haiti devoted itself to hauling logwood to the ports, where it was eagerly bought up at greatly advanced prices by every speculator who could get hold of any funds for the purpose. Great piles of logwood lay in every port, awaiting transportation to the United States. Incidentally, many of the speculators lost heavily on the transaction, because it was impossible to get space on the few available vessels. Also, freight rates went up remarkably, cutting out the estimated profits of the exporters.

This occurred just before the commencement of the coffee harvest, when merchants were accumulating gourde currency slowly, in anticipation of coffee purchases in the interior. The gourdes had been slowly rising and had almost reached the value of twenty cents (five to one), at which value the plan of stabilization was to be put into effect. Suddenly the exchange rate rose sharply, slightly passing the rate fixed in the plan. Instead, therefore, of letting the rate come slowly to the desired point, and holding it there, it now become necessary to force it back to the point it had passed.

All salaries and government expenditures were immediately ordered to be paid in U. S. Currency at one dollar for five gourdes. This caused bitter complaint, for, where two weeks previously settlements of all kinds were requested in "gold" rather than in gourdes, now, with a slightly enhanced value of the gourde, "gold" was scorned. At the same time, all merchants, contractors, etc., who had payments to make to laborers and country people were allowed to exchange their United States Currency for gourdes, at the bank, at the fixed ratio of five to one. This was because laborers and ignorant country people were not accustomed to American money and would not take it. This permission had to be very closely watched, and all but bona fide requests refused. Also, purchases were made from time to time of United States Currency, using gourdes in exchange, a few points off the market rate.

These steps were possible because there was always a steady inflow into the "Admiral Caperton Account" of both gourdes and "gold." Export duties were by law payable in United States Currency. Import duties had to be paid partly in gourdes and partly in United States Currency, that is, a flat duty in gourdes and a surtax in gold. Consequently, exchange operations of the character described could be carried out indefinitely.

The rate was soon forced back to the five to one ratio and maintained there during the rest of our stay in Haiti. I am informed that it has not varied much in the years since, and I am confident that if it had been properly supervised, it would not have varied at all.

There were several amusing features in connection with this struggle. In the first place, it must be realized that it was far

from the interests of the exchange speculators to have a fixed rate of exchange established as it practically deprived them of their business. During the preliminary discussion of the plan before the Board of Trade there were several near riots, so warm did the arguments become. There was a pretty general opinion held that it was economically unsound to attempt to influence exchange rates by governmental control, and that natural laws of trade ought to have full sway. Quotations from the best French economists were used with great effect, and the Administrator of Customs was shown to be ignorant of financial laws and trying to accomplish the impossible. But this was a case where the usual arguments could not be held to apply, because we were dealing with an absolutely fixed quantity of Haitian paper money circulating side by side with United States Currency, which varied in quantity with trade demands, and which was itself the actual legal medium of exchange and standard. Anyway, the exchange rate was stabilized and remained so.

Perhaps the most touching argument was used by the Minister of Finance. He said that his friends had always been accustomed to see the exchange rate fluctuate up and down, they counted on it, and that it would be an economic crime to interfere with it and ruin their business.

Shortly after our arrival in Haiti we learned that the previous Government in power had contracted for the printing of two or three million gourdes, to be added to the existing stock. The United States authorities did not wish this additional paper money to go into circulation, because a contract existed between the Haitian Government and the Haitian National Bank which provided for a new currency plan under which the bank was to issue notes, and all Government notes were to be retired. Owing to revolutions and disagreements with the bank, this plan had never been put into effect. Pending settlements of disputes and rehabilitation of the country it was evident that the Haitian Government should not issue any more paper currency, as the effect would be to simply depreciate the value of the currency in circulation. It was, however, a convenient way for the Government to put itself in funds at that time, and, as we know,

is a plan which many supposedly more enlightened governments have availed themselves of pretty freely in the recent past.

However, a shipment from the United States of a half million gourdes was reported to have been made, and we were directed to seize this shipment and hold it. The vessel on which the notes were suspected to be, reached Port-au-Prince and the Collector of Customs (Stevens), met her before she got into the harbor. He asked the captain if he had the notes, and the captain sent for the manifest to find out. Reading of the manifest failed to disclose any such item. It looked as though a mistake had been made. However, on reading over the manifest again, Stevens noted an item calling for ten boxes of stationery, and further inquiry developed the fact that this "stationery" was stowed in the ship's strong room. So the first cargo taken out of the ship was the ten boxes, which of course contained the half million gourdes, in one and two gourde notes. They were stored in the Custom House, and while they were never signed up—they were supposed to be signed individually by the Haitian officials before becoming money—they had their use later, in the following way:

At the time when the struggle to maintain the currency was most acute, and the value of the gourde was tending to appreciate unduly, on account of the scarcity of notes for circulation, that is, during the logwood speculation, the question was often discussed as to what the effect would be if these seized notes could be utilized. With a total circulation of about 7,000,000 gourdes in the country, the sudden addition of 500,000 would undoubtedly have had a marked effect on the exchange rate. However, under the circumstances, there was no legal way to do this. But the fear that it might be done caused considerable hesitation on the part of those interested in speculations on the value of the gourde. Here it should be explained that exchange quotations were always made by indicating the number of gourdes necessary to make a dollar. So, as gourdes rose in value, the exchange rate dropped. It had receded from five to four ninety and down to four eighty. Desperate measures were necessary. Accordingly, word was sent to the Custom House to break out the ten boxes and deliver them to the bank. As much noise was made about this as possible. Each box was handled by as

many laborers as could get around it and a guard of marines accompanied the procession which stretched out considerably and took the longest convenient way to the bank. So that by the time the boxes were finally deposited in the bank's vaults pretty nearly everybody in Port-au-Prince knew what was going on.

It was immediately assumed that the notes were going to be signed and issued, and the belief caused the exchange rate to jump back to four dollars and ninety cents that same day, from whence it was gently but firmly led to its resting place of five to one in the few days following.

The plan adopted succeeded completely, and it was not long before the population became accustomed to the fixed rate and learned to count upon it as permanent matter. There were many efforts made, at first, to upset the fixed rate, as those who had made a practice of dealing in local exchange found their business ruined. Many objections were raised by employees to receiving their pay in U. S. Currency, at the time when they had counted on gourdes going to a premium, but a firm stand was maintained in this regard and eventually opposition ceased.

The public debt of Haiti was a matter of great interest and I devoted much study to it while stationed in that country, and immediately after my return to the United States, when I was assigned to duty in the State Department for a few months.

The debt was divided into three classes, as follows:

External Debt, about $20,000,000; market value	$16,000,000
Internal Debt, about $2,250,000; market value	1,625,000
Floating Debt, guarantees of interest, etc	2,250,000

All of these debts, or rather the bonds, mortgages and agreements, were secured by liens on the customs revenues, in various forms. Such liens were called "affectations," and consisted in the setting aside, or ear-marking, of duties arising from the import or export of specified commodities. For example, the export duty on coffee, which was $3.00 per hundred pounds, was allocated as follows:

External Loan of 1875	$ .33 1/3
External Loan of 1896	1.20
External Loan of 1910	1.00
Interior Loan of August 14 1914	.05
Contract for Street Repair, Port-au-Prince	.03

Subvention, French Cable Co.	.05
Irrigation of Plaine des Cayes	.10
Market and repair of Streets des Cayes	.05
Total of Affectations	$2.81 1/3

Thus, of the $3.00 collected on each 100 pounds of coffee exported, there was only eighteen and two-thirds cents available for the ordinary expenses of the Haitian Government.

This affectation system was a serious bar to any proposed readjustment of the Haitian tariff, since the fact that revenues from certain duties were pledged for specific debts made it practically impossible to readjust the tariff in any way whatever. For this reason, and also because it was evident that the face value of the outstanding debts could be reduced, with consequent lowering of interest charges, it was considered highly desirable to refund all obligations of the Government, and to substitute a guarantee based solely on the rehabilitated credit of Haiti, in place of the complicated affectation method.

The foreign debt, which constituted the bulk of the country's obligations, was made up of three bond issues, all of which had been issued under French supervision. They stood (in 1915) as follows:

Loan of 1875—Outstanding	Fcs. 19,252,560
Loan of 1896—Outstanding	Fcs. 37,638,500
Loan of 1910—Outstanding	Fcs. 64,021,000
Total	Fcs. 120,912,060

At the normal rate of exchange these bonds would have a value of $23,336.27, but exchange was not normal, francs at that time being quoted at around six to one. Consequently, the exchange valuation of this sum was approximately $20,000,000. But the Haitian bonds were quoted on the Paris-Bourse at something like eighty per cent which, by taking both exchange and market values into consideration, gave a net value to these bonds of approximately $16,000,000.

At this time (end of 1916) the French Government was using every effort to obtain loans in the United States, and was offering as collateral every form of security which could be gathered in. Some of these very Haitian bonds had been pre-

sented for examination in this connection, but had not been considered sufficiently gilt-edged for acceptance. It was thought possible to take advantage of the exceptional circumstances then existing, to the mutual advantage of the French and Haitian governments, and this was the plan developed:

As the Haitian bonds were almost entirely owned by French citizens, it was proposed that the French government should take over the entire liability for the Haitian bonds outstanding, issuing French bonds to be exchanged for the Haitian bonds as presented from time to time. As compensation for doing this the French government was to receive approximately $16,000,000 from the Haitian government (depending upon the valuation to be fixed, in conference, of the outstanding Haitian bonds). A new consolidated bond issue for Haiti was to be financed by an American bank or syndicate, for the following purposes:

To redeem existing external debt	$16,000,000
To redeem existing internal debt	1,750,000
To redeem existing floating debt	2,250,000
To pay back interest due	1,500,000
Miscellaneous public works, promotion charges, etc.	8,500,000
Total	$30,000,000

It was planned that the new loan should be for a term of thirty years, at six per cent, and should include proper provision for amortization. It was figured that the bonds would be taken by the syndicate at about ninety-six per cent and offered to the public at about ninety-eight per cent. This would give the Bankers a possible profit of $600,000, which, considering the expenses of flotation and the risks involved, was thought not to be excessive, and certainly not unusual.

To carry this plan into effect it would of course be necessary for the United States Government to furnish some form of guarantee that the Haitian Government would carry out its obligations as to payment of interest and principal of the consolidated debt, otherwise the capital would not be forthcoming. It was thought that this might well be arranged for in the shape of a written agreement between the two governments to the effect that in consideration of the good offices of the United States in obtaining the proposed loan of thirty million

dollars, it would be understood and agreed that the United States would intervene in case of failure on the part of Haiti to pay either interest or principal when due. This agreement was intended to be much the same thing as the Platt amendment in the case of Cuba.

This matter was laid before the French Government, after conference with its representatives in this country, and the French Government indicated its willingness to carry out its part of the plan, which would result in the obtaining of about $16,000,000 for that government under obligations issued almost entirely to its own citizens. The floating of the new loan was looked upon favorably by New York and Chicago bankers, provided the backing of our own government was assured. The treaty between Haiti and the United States, which had now been signed, provided for supervision over Haitian affairs by our government for a period of ten years with a possible extension to twenty years, and included Articles relating to aid to be given by the United States in matters of reorganization and financing. The additional agreement, mentioned above, seemed to be in accord with the spirit of the treaty, and it was believed that it could be entered into without formal amendment of the treaty itself. It was thought, further, that the understanding that the United States would continue to maintain an interest in Haitian financial affairs throughout the life of this loan would be a great help in attracting capital to Haiti, and would be in every way beneficial to that country.

The plan was laid before the President by the Secretary of State, and the President approved it, stating, however, that he would like to have the opinion of the chairman of the Senate Foreign Affairs Committee as to the necessity of amending the Haitian treaty in order to carry the plan into effect. The chairman, after considering the matter, expressed the opinion that the treaty should be amended. This was hardly practicable at that time, and although the matter was placed in modified form in several successive attempts, no success was ever achieved in putting through a loan with consequent refinancing of Haiti. As far as I am informed, the situation has remained practically unchanged up to the present time.

This was a great disappointment to me, as I had become very enthusiastic in developing this plan, and regarded it as being in every way for the advantage of Haiti, in whose people and their prosperity I had become exceedingly interested. I still believe that the matter should have been carried through as proposed, in which case conditions in Haiti would now be much better than they actually are.

To go back a little, my term of service in Haiti ended in September, 1916, a General Receiver of Customs having been appointed to take over the customs service, and a Financial Adviser to take over the fiscal matters, as provided in the treaty. I turned over both offices with considerable regret, even though it meant getting back to home and family. The work itself was so interesting that I disliked giving it up.

The other officers who had come down for this service had been withdrawn some time previously, and their places had been taken by Naval Pay Clerks, who did excellent work in various ports. They remained for several months thereafter, until competent substitutes could be obtained from the United States.

There were many more matters of interest which could be described, in connection with this year's duty, but to do so would be to unduly lengthen this paper. It has been considered wiser, therefore, to confine it to the features already briefly touched upon.

NOTE: This article was written late in 1921. Since then a Haitian loan of $30,000,000 has been effected and the bonds are now being marketed.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

A TRIPOLITAN WAR RECORD

Letter dated November 12, 1804, written by Midshipman Robert T. Spence, U. S. N.; with introductory note by Professor Allan Westcott, U. S. Naval Academy.

The highly interesting personal letter which follows, narrating events in the war between the United States and Tripoli, was found recently among family papers by descendants of the author, Midshipman (later Captain) Robert Traill Spence, U. S. N. Spence was commissioned midshipman in 1800, and was one of Commodore Preble's "schoolboys" in the Mediterranean Squadron during the lively campaign of 1804. His father, Keith Spence, was a Portsmouth (N. H.) merchant who had been purser in the captured U. S. S. *Philadelphia,* and was at this time a prisoner of the Bashaw.

The younger Spence's gallantry in the second gunboat action off Tripoli, August 7, 1804, won him his promotion, as stated in his letter, and has come down in history. He was in Gunboat *No. 8,* (one of those captured four days before), which blew up with the loss of her commander, Lieutenant Caldwell, and fifteen others out of a total complement of twenty-four. Fenimore Cooper, describing the affair in his *Naval History of the United States* says: "When the smoke cleared away all the after part of the boat was under water, while Mr. Robert T. Spence, of the *Siren,* and eleven men were forward, loading the long 26-pounder that formed her armament. This gun was loaded, and fired, and its gallant crew gave three cheers, as their vessel sank beneath them. Mr. Spence, who could not swim, saved himself by an oar. . . ."[1]

[1] Vol. II, p. 51. Cooper agrees with the letter as to number of casualties, but gives the complement as twenty-eight. The eleven men he mentions were presumably the original guncrew, and not all there after the explosion.

From a historical standpoint, the letter has an interest also in that it throws some light on the mystery as to the exact circumstances attending the loss of the famous *Intrepid*, which Spence here speaks of as an "Infernal," sent into the harbor of Tripoli on September 4, 1804, under Lieutenant Richard Somers. The vessel blew up with the loss of all on board. Commodore Preble, in reporting the results of the disaster, says in part: "One of the enemy's largest gunboats was missing, and three others were seen very much shattered and damaged, which the enemy were hauling on shore. From these circumstances, I am led to believe that the boats were detached from the enemy's flotilla to intercept the ketch, without suspecting her to be a fireship. The boat afterward missing suddenly boarded her. The gallant Somers and the heroes of his party, observing the other three boats surrounding them, and no prospect of escape from them . . . . put a match to the train leading directly to the magazine, which at once blew the whole into the air, and terminated their existence." Evidently this report, which was written soon after the affair, was not based on any information from the shore.

Cooper in his history states that it was the general belief in the squadron that the *Intrepid* was boarded; but he himself inclines rather to the opinion that the explosion was accidental and not due to an actual attack. In proof he calls attention to the report of only thirteen bodies recovered, and to the entry in the diary of Captain Bainbridge (then a captive), "Was informed that the explosion that we heard last night . . . . did no damage whatever to the Tripolitans."

Spence's story, it will be seen, is much more definite. He says the *Intrepid* was "within the rocks and only one-half mile distant from the Bashaws Castle," that she was "boarded by two Gunboats, fifty men each," and that "she went up, sending 100 Turks and fifteen Christian souls to eternity." His estimate of the Turks killed is no doubt based on his knowledge of the customary crews of the Turkish boats. His account differs in other details from Preble's, the latter giving the complement of the *Intrepid*

In this and other details, the letter would seem the best authority. According to Cooper, the gunner who assisted Spence was made a commissioned officer.

as only thirteen, and her load of explosives as only "about 100 barrels of gunpowder and 150 fixed shells."

Although he speaks of "information from Tripoli," Spence's version may reflect merely the common belief in the fleet. It is noteworthy, however, that he is corroborated by the American ex-Consul at Tunis, William Eaton, who "a few months later met a Turk in Egypt who had been in Tripoli at the time of the explosion, and who affirmed that the *Intrepid* blew up 'after having been boarded by two row galleys.' "[2]

Of Spence's later career in the service, it may be noted that he rose to the rank of captain in 1812; was highly commended by Commodore Rogers for his promptness and ingenuity in laying obstacles in the way of the British Fleet off Baltimore in September, 1814; was active against piracy in 1822 as senior naval officer in the West Indies; and built the first fort at Mesurado, in Liberia. He married Mary Carroll, daughter of Nicholas Carroll of Maryland, and died at his home near Baltimore, September 26, 1826.[3]

The letter which follows is addressed to "Mrs. Keith Spence, Portsmouth, New Hampshire." As printed it preserves the original punctuation, capitalization, and spelling.

Gibraltar, November 12, 1804

Dear Honoured and Respected Mother:

I wrote you from Malta, on the 6th ultimo, mentioning the late change thats taken place in my situation; and advis'd you of our intention to leave that place for a few days. On our arrival we found the *Essex* Frigate which ship I intend joining. Capt Stephen Decatur is to succeed Capt Barron, in the Command of her. This Capt Decatur is a friend of my Father's no doubt you have heard of him by fame; he Commanded the expedition in burning the Philadelphia & for which he was promoted to a post Captain although greatly out of his turn—He since has done an action, which by far exceeds the brilliancy

[2] Quoted from Eaton's papers in Prentis's *Life of the Late General William Eaton* (see Allen, *Our Navy and the Barbary Corsairs*, Vol. II, p. 210).

[3] Biographical details from Howard, *Genealogy of the Cutts Family*. 1892.

of that; it perhaps for intrepidity & Courage equalls any thing ever done; In the Action of the 3 of August he entered with his division of Gun Boats (which was only 3) the Harbour of Tripoli under the fire of 60 pieces of heavy Cannon from the Batteries & 20 pieces from their Gun Boats—boarded, himself, & brought out 2, Mounting each superior forces & carrying a greater number of men. A Circumstance were you present to see it done you could hardly conceive it credible. In this affair he lost his brothers Lieut James Decatur, who Commanded a boat of his brothers division he was shot through the head with a Dundebuss in the Act of boarding a boat—One boat more was brought out by a Lieut Tripp who received 11 dangerous wounds in boarding (he's recovered of them). The Capt of this boat died in the most Heroic Manner. Although cut all to pieces by the Assailants swords he continued to fight; Lieut Tripp, who encounter'd him, was almost falling with weakness from the loss of Blood; when one of his sailors run him through with a Boarding Pike. He died brandishing his Sword & exhorting his men to revenge the death of their Commander. The Contest was long, 20 Turks lay weltering in their Gore, before they surrenderd to the Americans. Out of 170 men, which man'd the Boats, 50 only were captured alive. The day following we brought too a French privateer & sent her in with 25 woonded Turks; they were past recovery. The next Action, the Boat I was in, Commanded by Lieut Caldwell, was Blown up. The Lieut, with a midshipman and 14 men, out 24, were kill'd. I, astonishing to relate, & 6 men escaped. 4 of the men in so wounded a condition that their lives, at first, were despair'd of. It was my Conduct on this occassion that got me my Promotion. I, at the time the shot struck, was forward, taking sight at the Gun; though not a minute before I had been aft, assisting in binding up the woonded It being a red hot shot, she instantly exploded; I went up some distance in the air, & lighted by the Gun again; the only part remaining was that on which the Gun stood. I found by my side, one man only. Around me lay arms, legs, & trunks of Bodies, in the most mutilated state; though a little confused & bewilder'd by things tumbling on my head, & by the prospect of death before me; for I cannot swim, I had presence of mind sufficient to know my duty, & not to quitt while there was a part remaining. I fired

the Gun, & loaded her again. When she went down from under me I gave a cheer and went down—came up again; when I was taken up by one of the other Gun Boats—I cannot describe my sensations, on this meloncholy Occassion—I felt as though I wish'd to die, because I should die Nobly—This accident will distress my Father much, as Mr. Caldwell he look'd on as a Son, & loved him equally as well as he does me; in fact I never knew so pure, and so strong a friendship to subsist between any two men. He certainly was the most honourable little fellow I ever knew, & the most respected of any young man in the Navy—My Father in a letter from Washington to me says thus, "Remember me to my oldest of all Modern Friends Mr. Caldwell." You may judge from this language how fond he was of him. Young Dorsey was a man of great Merit & highly esteem'd by me. I saw Mr. C. after he came down, without arms, or legs; his face so mutilated that I could not discriminate a feature—by his dress only, I recognized him; he was not dead although he sank instantly—I made another escape as astonishing as this. I made application, as well as Capt Stew't for me, to go in to the Harbour of Tripoli, in an Infernal, containing 150 Barrels of Powder & 300 shells, for the purpose of blowing the Bashaws Castle up; this expedition was Commanded by Capt Sumers— I received no direct answer, from the Commodore, & of course, expected to go; but a favorite of the Commodores, persuaded him, to allow *him* to go. Capt Decatur then made Application for me; But the Commodore reply'd he had already selected the officer, that was to go with Capt Sumers; the Night came—She went in, all were anxious with expectation when Cannon announced her near approach to the Castle. Cannon were fired from all parts of the town. In a few moments she went up—How awfully Grand! Every thing wrapp'd in Dead silence, made the explosion loud, and terrible, the fuses of the shells, burning in the air, shone like so many planets, a vast stream of fire, which appear'd ascending to heaven portrayed the Walls to our view—20 minutes elapsed, without seeing the signal agreed on, between Capt S & the Commodore. Guns were fir'd from the Commodores ship; signals repeated by the different vessels—our small schooners sent to reconnoiter the Harbour—but no Boat appear'd. Poor Sumers a Lieut & a midshipman were gone, no more to

return! We conjectured the explosion to have been premature; it has since been confirm'd by information from Tripoli. He was within the Rocks, & only 1/2 mile distant from the Bashaws Castle, when he was boarded by two Gun Boats, 50 men each,– He might have escap'd; but he started with a determination never to let so seasonable a supply fall into their Hands; & never to return alive unless he had, satisfactorily, executed his mission. He touched fire himself to match & she went up, sending 100 Turks and 15 Christians souls to eternity. What a Noble Death, & truly characteristic of that Noble Sumers. He certainly was an extraordinary man. He united every thing that made the man, or the officer—possessing more firmness & determination than any man I ever saw—sought danger in every shape—dangerous undertakings were the most pleasing ones to him. In loosing him we were deprived of one of the Navys most valuable officers. The Lieut with him was a schoolmate of William's his name was Wadsworth, of Portland.

Much will be done the ensuing Summer. Our force will be formidable. I shall expect the command of a Gun Boat. I hope an oportunity may offer that I may do something conspicuous. It's impossible to conceive that spirit of emulation which prevails among officers & men; danger is sought for, & the most daring intrepidity has been discover'd, in officers. Commodore P. has been succeeded by Commodore Barron, a senior officer; But in the most delicate manner. The letters from the President, to him, are of the most flattering kind, pointing out the necessity of this Act. He returns to America soon, to receive the grateful applause of his Countrymen. He certainly deserves *all* the Honours they can pay him, & more too. His conduct in Bombarding Tripoli with so *pitifull* force has astonished all Europe.

Your affec son,

R. T. SPENCE.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

THE SALVAGE OF THE U. S. S. "ALLEGHENY"

By Lieutenant Ralph Davison, U. S. Navy
AND
Lieutenant Donald Royce (CC), U. S. Navy

The sinkings of ships, and their salvage, are always attended by circumstances of great interest. The U. S. S. *Allegheny*, station tug at the Naval Air Station, Pensacola, was sunk and salvaged under unique circumstances which fully bear out this rule.

The *Allegheny* was built by the American Shipbuilding Company of Buffalo, N. Y., at a cost of $430,921, and was completed November 15, 1917. She is a seagoing tug of the following characteristics: displacement, 1,000 tons; length over-all, 155 feet; breadth, 30 feet; mean draft, 15 feet.

During the morning of July 5, 1922, while assisting in docking the U. S. S. *Orion* at the Naval Air Station, Pensacola, the *Allegheny* was struck on the starboard side by the *Orion's* port propeller; a hole, twenty-eight inches long and four inches wide, was torn in the shell plating of the *Allegheny*, just abreast the starboard boiler, at the turn of the bilge; and the fireroom started to flood. The commanding officer immediately attempted to beach his ship, and momentarily it appeared that the main circulating pump, drawing from the bilges, would keep the ship free of water until she could be grounded in shallow water. The water in the fireroom, however, rose so rapidly that it became necessary to shut off the fuel; the steam pressure dropped, the pump stopped, and the vessel, with fire and engine rooms completely flooded, sank in water whose mean depth was twenty-four feet. In this position, she has a list to starboard of twenty-nine degrees.

The *Allegheny*, from calculation, would have remained afloat, even with a completely flooded fireroom, provided the remaining spaces could have been kept free from water. But this was not possible, for the after fireroom bulkhead proved to be decidedly non-water-tight, due primarily to an eighteen inch circular opening, which had been cut in the bulkhead near the forced draft blower suction to provide fireroom ventilation (closed-ashpit system of forced draft). In addition, there were openings about the main steam line, the blower duct to the fireroom, and in the structure itself.

Plans were immediately made for salvaging the vessel. It was first planned to place a patch over the opening, but examination by a diver revealed that the vessel was grounded so as to obstruct at least a third of the hole. The opening could not be closed from the inside due to its location abreast the boiler, access to which space was prevented by web frames, boiler saddles and longitudinals.

It was therefore decided to isolate the engine room, and pump it free of water, with the expectation that the vessel would then float. In her grounded position, the forward compartments of the *Allegheny* were not flooded.

Seaplane Wrecking Derrick No. 1 was placed along the port side of the *Allegheny*, and the following pumping equipment was assembled on its deck; one twelve-inch 2,500 gallons per minute centrifugal pump, electrically driven; two four-inch 300 gallon per minute centrifugal pumps, electrically driven, and in the station fire-boat, one three-inch 200 gallons per minute centrifugal pump, gasoline driven.

To prevent the vessel from sliding stern-first into deeper water, her bower anchors were carried out and dropped well forward; while to prevent her further listing to starboard as she floated, preventers were rigged from both her masts to the dock.

Divers succeeded after forty-eight hours in closing, by means of a wooden patch, the eighteen-inch ventilating opening referred to above. They worked under the greatest difficulties in the confined spaces of the engine room, and only the utmost ingenuity and perseverance enabled them finally to succeed. The opening around the main steam line was plugged with wooden wedges, and the blower duct from the fireroom was blocked with kapok

mattresses and pillows, introduced through a manhole in the duct on the fireroom side.

Pumping was started on July 8, three days after the accident, but due to structural leaks, and openings previously unaccounted for, no headway could be made. Several other attempts were made, with no success, and it was not until 4:00 P. M., July 9, that definite results were accomplished. On the morning of that day, a two-inch steam line had been run from the *Orion,* which was berthed just across the dock, and connection made to the auxiliary steam line of the *Allegheny;* the purpose of this was to use the tug's main circulating pump in freeing the vessel of water. This is a reciprocating pump of large capacity, with a thirteen-inch suction already open in the lowest part of the engine room; it was later to prove of the greatest importance in the salvage of the vessel.

Pumping was again begun, the water lowering rapidly at first, but then more slowly as the head on the numerous leaks grew greater. Fifteen to twenty men were constantly at work in the engine room, plugging the minor leaks in the bulkhead as they were uncovered. Progress was very slow, and after thirteen hours (at 5:00 A. M., July 10) the level of the water remained constant. At this time, the ship's circulating pump, upon which steam pressure had been maintained since 2 A. M., finally freed itself of water, and began to pump vigorously; its discharge was above water, and a full ten-inch stream was thrown six feet clear of the side. This additional pumping capacity was so much "net," and results were soon achieved.

At 6:30 A. M., the vessel floated, but she was still listed at her former angle of inclination, some twenty-nine degrees, and great fear was entertained for her safety. Pumping was continued, and the vessel started slowly toward the upright, when a casualty occurred which set at naught all the preceding labor. There had been a shortage of flexible steam hose on the station, and in making up the line from the *Orion,* only twenty-five feet was made flexible. The tug, as she righted, bore heavily against the rigid portion, with the result that it collapsed upon itself, and carried away at the junction of the horizontal section with the down-comer on the *Orion's* side. The pipe, carrying 180 pounds of steam, revolved about its connection on the *Orion* with

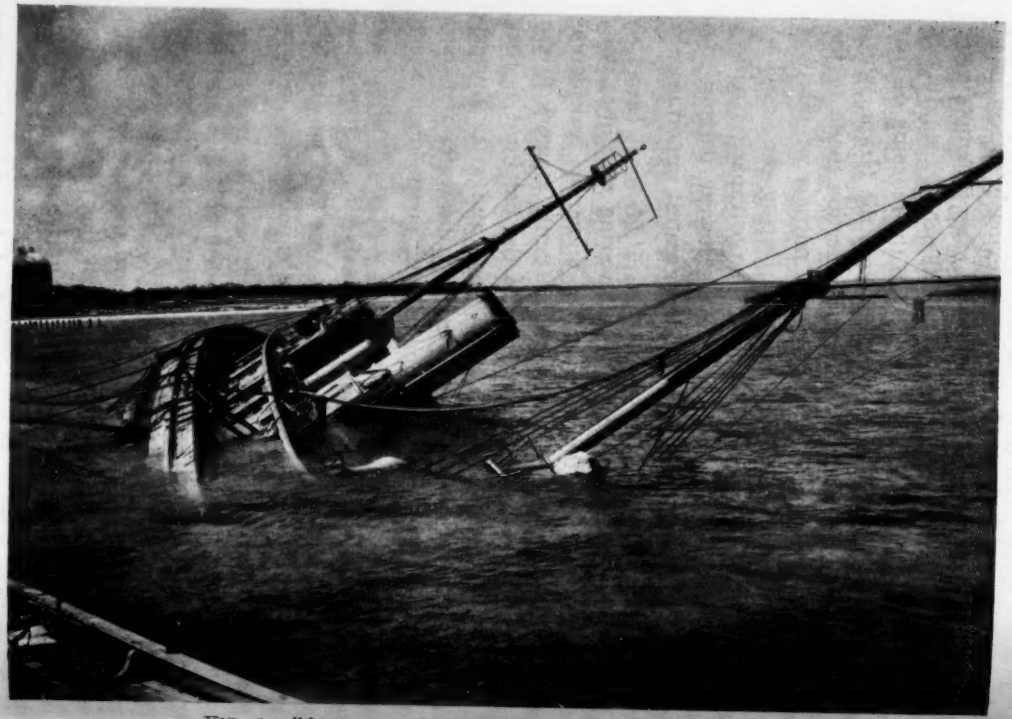

FIG. 1.—"ALLEGHENY" AFTER FIRST ATTEMPT AT SALVAGE

great velocity, resembling a giant pin-wheel in its action, and it is little short of miraculous that of the crowd of men engaged in the salvage operation not one sustained even minor injuries from the escaping steam and flying pipe.

The loss of the ship's pump was in itself serious, but the hand of Fate seemed against the whole proceeding, for the escaping steam melted the insulation of the electric leads to the twelve-inch pump, causing a partial ground, and a great reduction in the pump's speed. The loss of these two mainstays proved fatal, for the ship began to fill rapidly, and to settle deeper and deeper. A desperate attempt was made to tow her, with the seaplane wrecking derrick, into shallow water, but she was sinking too rapidly, and before shallow water could be reached, she sank, and listed heavily to starboard in so doing. Thus, at 7:00 A. M., July 10, after one hundred fifteen hours of continuous work, the poor old *Allegheny* was again *hors de combat*, resting on her starboard side, in about twenty-six feet of water, and this time listed forty-nine degrees. Her new position (See Fig. 1) was decidedly more unfavorable to salvage than her old, and a heavy air of gloom settled on the personnel that had struggled so persistently to get her afloat.

Before further efforts were made, it was considered best to make a careful survey of the situation, to review the past, to devise new ways and means, and to determine on future procedure. To this end, a board was appointed by the Commandant. The board recommended as follows: (a) That additional equipment, consisting of two submersible pumps, 150 feet of six-inch suction hose, and 200 feet of flexible steam hose, be obtained; (b) that the services of an expert civilian diver be secured; (c) that additional steps be taken to prevent the vessel from crabbing and from turning over; (d) that the former method of salvage, by pumping, be again employed, and (e) that although the operation would interfere with the mission of the Air Station, it could be done by the Air Station with the least final cost to the government, and it was accordingly recommended that the Air Station again attempt the salvage with its own personnel and equipment supplemented by that recommended.

FIG. 1.—"ALLEGHENY" AFTER FIRST ATTEMPT AT SALVAGE

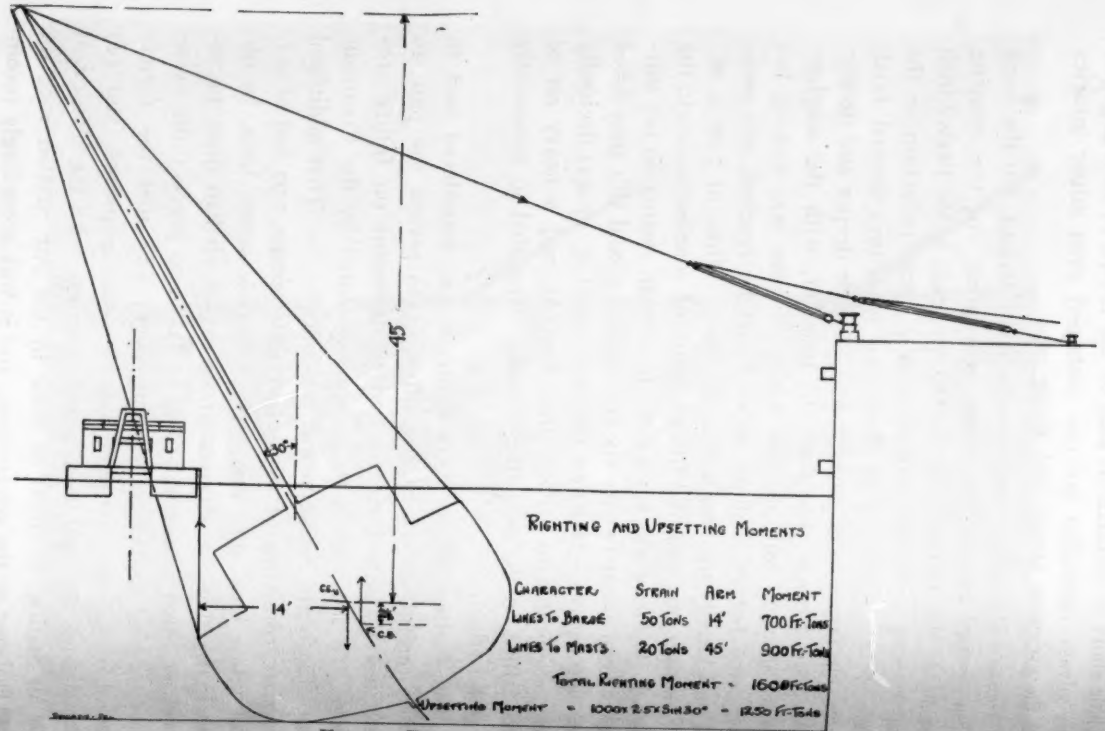
45'
30°
14'
C.G.
C.B.
RIGHTING AND UPSETTING MOMENTS
CHARACTER. STRAIN ARM MOMENT
LINES TO BARGE 50 TONS 14' 700 FT-TONS
LINES TO MASTS 20 TONS 45' 900 FT-TONS
TOTAL RIGHTING MOMENT = 1600 FT-TONS
UPSETTING MOMENT = 1000 × 2.5 × SIN 30° = 1250 FT-TONS

FIG. 2.—DIAGRAM SHOWING FORCES ACTING

The recommendations of the board were approved, and steps were taken to put them into effect at once. Operations were resumed on July 11. Investigation of the condition of the vessel revealed that she was near an unstable position, with a possibility of rolling toward the upright, or of turning turtle. Her normal angle of repose, resting on the bilge and the bar keel, is only eighteen degrees on a flat hard bottom. However, an unknown resistance would be offered by the sand and mud which had accumulated under her keel, but it was decided to attempt to right the vessel in order to float her at an angle more nearly normal, as well as to facilitate salvage operations, (see Fig. 2.) Accordingly, two five-eighths inch wire hawsers were made fast at each masthead, carried to the dock, and fitted with luff-on-luff tackles. By this means, a strain calculated at ten tons was put upon each mast, and the vessel was rolled to an angle of twenty-nine degrees. At this point it became apparent that the ship was being pulled in sidewise toward the dock and deeper water, and as the angle was then favorable enough, the attempt was discontinued, and she was secured as she stood. Her position after this careening is shown in Fig. 3.

To prevent the vessel's capsizing on breaking ground (it was predicted that she would be unstable at this moment), Seaplane Wrecking Derrick No. 2 was placed along the *Allegheny's* starboard side, and filled with about forty tons of water. Hawsers were rove around the *Allegheny's* bow and quarter bitts, and made fast to the wrecking derrick, which was then pumped out, placing an initial strain on these cables. It was estimated that at the time of floating the free water surface of fore hold and engine room would wipe out any water plane derived from the hull's structure and the small amount of deck house above water. The center of gravity in this position was estimated at about two and one-half feet above the center of buoyancy. Thus there would be an upsetting moment of $1{,}000 \times 2.5 \times \sin 30° = 1{,}250$ ft. tons. The means of neutralizing this were provided as shown on sketch. To prevent crabbing, an anchor was carried out and planted abreast the stern on the starboard side, with the hawser made fast around the propeller shaft, while the vessel's own bower anchor was similarly planted abreast the bow.

The salvage material ordered July 12 from the Navy Depart-

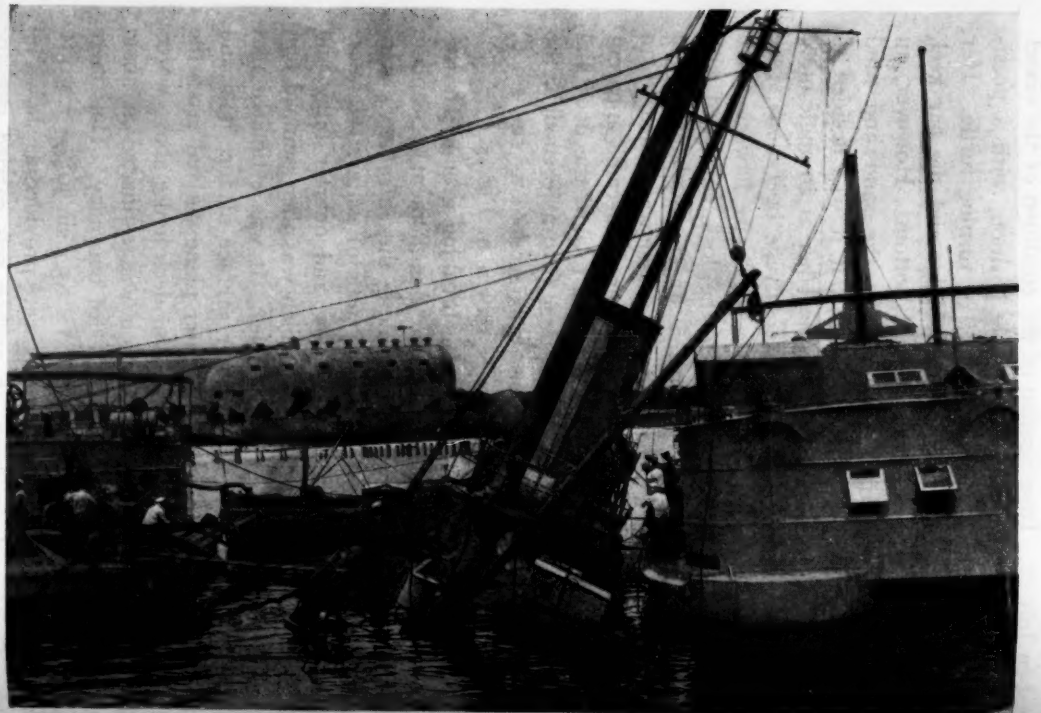

FIG. 3—U. S. S. "ALLEGHENY" SALVAGE OPERATIONS
(See Page 642)

ment, arrived from the New York and Norfolk Navy Yards on July 16. The submersible pumps were found to be too large to lower into the ship, so one was therefore set up with the other pumps on Derrick No. 1, while the other was slung from the *Allegheny's* forward boom in a position which gave it a short and efficient suction line to the fore hold, which had filled at the second sinking. The flexible steam hose was used to provide a connection between the yard locomotive and the ship's auxiliary steam line. The diver was engaged from July 13 in closing openings in the deckhouse and bulkheads of the engine room, not previously submerged. A cofferdam was constructed on the forward engine room skylight, and all pump suctions to the engine room were led through this opening. A hole was burned in the forecastle companion way to provide access for the forward pump suction.

Preparations were completed July 21, and pumping began at 2:00 P. M. that day. An half-hour's pumping was found sufficient to free the fore hold of water, and all attention was thereafter devoted to pumping the engine room, which was proving as troublesome as on the first attempt. The water level dropped very slowly. The ship's pump was finally persuaded to function by changing the steam connection so as to reduce the length of line under water. The locomotive had previously been able to supply only enough steam to care for condensation losses, and practically nothing for the pump. With the shortened lead, the pump soon took a new lease on life, and the level of the water in the engine room rapidly lowered. At 9:30 P. M., observers had the satisfaction of seeing the *Allegheny's* stern slowly rise and the vessel right to twenty degrees. Their satisfaction was lessened by the fact that as the stern came up, the bow went down, for the bow compartments had again filled. The pump forward was operated at full capacity, but seemed unable to clear the hold of water as before.

Meanwhile, diving operations revealed the fact that the change of trim had cleared the opening in the shell plating from the bottom. A patch, which had been previously prepared, (Fig. 4), was lowered over the side, and two divers succeeded after about half an hour in placing the patch over the opening in what later proved to be an almost watertight manner.

FIG. 3—U. S. S. "ALLEGHENY" SALVAGE OPERATIONS
(See Page 642)

Matters now appeared to be at an impasse; the stern was high in the air; only sufficient pumping was being done aft to hold what had been gained; no progress was apparent forward although the submersible pump was throwing about eight tons of water per minute from that part of the ship. It was felt that water was entering the fore hold through some new opening, and it was debated as to whether the fireroom should now be pumped, or operations suspended until daylight before taking

FIG. 4.—CLOSE-UP OF PATCH PUT ON "ALLEGHENY"

so radical a step. It was apparent and had been proven that the vessel should float with the fireroom flooded, if the fore hold were freed of water but it was not believed that she would free herself if the fore hold remained full of water. The ship quieted the argument, for at 2:30 A. M., the bow began to rise, the forward submersible pump all this time having been gaining slowly on a leak that developed in the hawse pipe with the increased trim by the bow; the change of trim had shifted the chain, which had torn out one of the wooden wedges driven in the hawse pipe.

The critical stage in the salvage had now arrived. The vessel was afloat and listed over at twenty degrees. Her unstable condition was revealed by a tendency to list still further. She started slowly over to starboard, and crabbed to port, easing off her masthead preventers, and crowding the inboard wrecking derrick against the dock. Timbers which had been placed at the corner of the derrick as chafing gear cracked and splintered, the masthead lines and masts groaned under the strain. The pumps, fore and aft, were working at full speed. The situation was a tense and dramatic one for all concerned. In the darkness, disaster loomed large; the turning turtle of the tug, with consequent wrecking of the two derricks and possible loss of life, seemed imminent. Nothing further remained to be done, except to pump, take up slack in lines, and hope. Providence was kind: at thirty degrees, the vessel hesitated, stopped listing, hovered a minute, and slowly moved back toward the vertical. Progress thereafter was sure and rapid, the water level dropping rapidly in all parts of the ship, which came nearer and nearer the upright. The main deck came out of water; the fireroom was pumped; inaccessible compartments were drained to the engine room bilges, and at 4:30 A. M., the *Allegheny* was afloat at but little more than her normal draft, and with only a few degrees list to starboard. At 11:00 A. M., the ship was towed to a local drydock, and docked for inspection and repair. Examination showed a badly bent stern frame shoe, in addition to the damage done by the *Orion's* propeller. Incidentally, it is interesting to note that the *Orion's* propeller was so slightly bent that she was not prevented from proceeding to her assigned destination, and that the personnel of the Air Station had the satisfaction of raising the *Allegheny* on the very day upon which the *Orion* returned to Pensacola from New Orleans. Indeed, the *Orion* anchored in the stream just as the salvaged *Allegheny,* slightly battered but still in the ring, was being towed to dock.

The *Allegheny* sank on July 5, and was floated on July 22. In view of the one unsuccessful effort, and of the many difficulties to be overcome, the performance is considered creditable, comparing favorably with similar salvages. The salvage equipment was invaluable, and the submersible pumps indefatigable. They operated in unheard-of positions, the one on the forward boom

performed at all angles, and functioned perfectly at one time with the boom being lowered away in jerks that seemed veritably to jerk the water away from it. It never faltered, and only gave up when it had established a suction head of twenty-five feet, and had wiped the fore hold clear of all except a little bilge water.

The total cost of the operations, including labor, material, power, transportation charges and salvage equipment, docking and repair of ship was less than $7,500. The Board appointed to recommend salvage procedure informally estimated the value of the *Allegheny* as she lay at $100,000, and the cost of salvage by contract, on a "no ship, no pay" basis at $50,000. Aside from the monetary saving, great satisfaction was felt that the Air Station, unfamiliar with such operations, and poorly equipped, could accomplish such a feat without requiring the assistance of a regular salvage outfit.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

EVIDENCE

By Commander Thomas D. Parker, U. S. Navy (Retired)

Recently, as a member of a permanent court-martial, the writer was impressed by the fact that often the court had to try the case and pronounce judgment without knowing the facts: that is, was forced to exclude important and material evidence; and this in spite of the (limited) discretion in applying the strict rules of evidence allowed by the Naval Manual.

To a mind untrained in legal refinements, this artificial blindness and deafness seemed lamentable—especially where a long prison term was in question. Though a pleasant life-long restriction, or lethal gas, may be the best cure for recidivists, no one cares to sentence boys or other first offenders on a half-knowledge of the case. To do this seemed hurtful not helpful to discipline.

Since those days of technically innocent profiteers and technically guilty recruits, the writer has had occasion to study these rules of evidence and the underlying theories. His earlier impressions are confirmed; learned persons, even judges and senators, have asked, "Must Justice be blind?"—to evidence?

This brief article deals only with the relation of the rules to naval courts.

But first the general question: Why is it that these Rules of Evidence are (largely) *Rules for the Exclusion of Evidence?*

The fundamental ground is distrust of the intelligence of juries.

"The jury, from the time it began to take on the character of an arbiter of the facts, must have been a disturbing element in the work of the court. It was an uncertain quantity, which, in the eyes of the judge, needed to be guarded against.

". . . . To what conclusions might not these men come; men ignorant of the law and its methods, unfamiliar with the ways of counsel, open to the influence of testimony and argument presented solely for the purpose of playing upon their sympathy, passion, and prejudices? This was a situation to be deplored, and to be relieved of its dangers as far as possible.

"Accordingly, with the beginning of the use of evidence before juries, we find the beginnings of the law of evidence. Statements to which the court might listen with impunity were carefully kept from the jury by excluding rules, established by the judges."[1]

Thus the constant fear was that the jury would over-estimate doubtful evidence; though all evidence is doubtful to some degree, and the rules as fixed seem arbitrary. For instance, dying declarations, however convincing, are admissible only in cases of homicide; and then, with various restrictions. They must be made "in contemplation of immediate death, with no hope of recovery"; they must relate "to the cause of death or the circumstances attending in the transaction resulting in death"; they are admissible only when "made by the person whose death is in issue on the trial." Hence the exclusion of countless death statements that would create moral certainty in a reasonable man. For instance, in a California[2] case a written statement began: "Believing I am very near death and realizing that I may not recover," etc. This declaration, of over-whelming importance, was ruled out because it suggested a faint remaining hope of recovery. In a Pennsylvania[3] case, the deceased was found in a lane near the house in which, shortly before, his wife had been found, still living but badly beaten. Her dying declaration was held inadmissible because the accused was on trial for the murder of the husband.

To take an example in a different field: where proof is introduced with regard to "character" (as a material fact in issue) the strange rule is that it must be given only by way of stating what the witness believes to be the person's general reputation—

[1] *McKelvey on Evidence*, Second Edition, p. 9.
[2] *People v. Hodgdon*, 55 Cal. 72.
[3] *Brown v. Commonwealth*, 73 Pa. 321.

not what the character is, of the witness' own (perhaps intimate) knowledge. Many other examples could be given.

It is well recognized that the inelasticity of rules like these is unfortunate; and in some cases common sense has triumphed over the rigid exclusions of past decades. At one time a party to a suit could not testify; nor could an infidel or a Jew. But in civilian practice changes like these take hundreds of years.

There is always a theory underlying the rule; but in most cases an intelligent civilian forming a private judgment, or an intelligent captain on shipboard, would wish to hear and would consider (with a coefficient deduced from experience) the evidence that is legal poison to a juror. In particular cases judges realize that the result is law not justice; but they are sworn to uphold the law.

The laws of evidence crystallized centuries ago when the average juror had the intelligence of a Russian mujik. But, "When the reason for the law ceases the law should cease." The modern juror (whatever his shortcomings) does not believe in a flat world of witches and of evil eyes. He can reason a little and does not believe everything he hears. The United States Supreme Court says:[4]

"The disposition of courts and of legislative bodies to remove disabilities from witnesses has continued . . . . under dominance of the conviction of our time that the truth is more likely to be arrived at by hearing the testimony of all persons of competent understanding who may seem to have knowledge of the facts involved in a case, leaving the credit and weight of such testimony to be determined by the jury or by the court . . . . we have significant evidence of the trend of congressional opinion upon this subject."

How much more all that is said above applies to naval courts-martial! In place of the medieval juror with his round, red face and stubby beard we have, for jury as well as court, a body of experienced officers, all trained professionally and to some extent legally, most of them Annapolis or college men. Are their tender minds unable to digest facts? Must we slam ancient doors in their faces when they ask for truth? Must we say to

[4] Mr. Justice Clarke in *Rosen et al v. United States*, 245 U. S. 467.

them: "You shall not hear these damning words because technically they are hearsay; you shall not hear A's dying confession because A had not absolutely abandoned hope; you must send this minor to prison because a clerk forgot to stamp the document that could clear him?"

Legal systems and administration are terribly cumbrous. Under our "dog-law," as Bentham calls it, a civilian cannot know he is wrong until hit on the head; cannot assert a right, because chained to a mass of procedual rules, like a dog to his block. The sound doctrine of *stare decisis* makes a change in these rules or in other law extremely difficult. But the Navy is a compact and in some respects, a self-determining body. The naval juror is a super-juror. He can "hear the testimony of all persons of competent understanding," and he can be trusted to weigh any evidence bearing on the issue.

That this view is not radical and is not opposed to the modern trend appears from the fact that various commissions (like the Industrial Accident Commission of California), having important judicial functions are now free to receive what evidence they please. Our own courts, which are not "courts of record," should be open to any testimony a wise captain would hear at the mast.

NOTE.—After the above was submitted, long after the thought had driven itself home, the writer chanced across the following dicta from high sources (the italics are his own):

Mansfield, C. J., in the Berkeley Peerage Case, 1811: "Upon this subject [hearsay] the laws of other countries are quite different; *they admit evidence of hearsay, without scruple.* There is not an appeal from the neighboring Kingdom of Scotland in which you will not find a great deal of hearsay evidence upon every fact brought into dispute. This has struck many persons as a great absurdity . . . But the different rules which prevail there and with us seem to me to have a reasonable foundation in the different manner in which justice is administered in the two countries. In Scotland, and *most of the continental states, the judges determine upon the facts in dispute, as well as upon the law;* and they think there is no danger in their listening to evidence of hearsay, because when they come to consider of their judgment on the merits of the case, they can trust themselves entirely to disregard the hearsay evidence, or to give it any little weight which it may seem to deserve."

Parke, B. in *Wright v. Doe dem. Tatham,* 1837: "It is true that evidence of this description has been received in the Ecclesiastical Courts [then part of the British judicial system]. But their rules of evidence are not the same in all respects as ours. *Some greater laxity may be permitted in a Court which adjudicates both on the law and on the fact,* and may be more safely trusted with the consideration of such evidence than a jury."

The Continental Courts, with their Roman tradition, the Scottish Courts, the Ecclesiastical Courts, even an English Chief Justice! The writer respectfully yields the floor to these.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

BRITISH SUBMARINES IN TURKISH WATERS

By Lieutenant Commander H. H. Frost, U. S. Navy

The exploits of the British submarines in the Dardanelles and the Sea of Marmora constitute one of the brightest and most interesting chapters of the history of the World War.

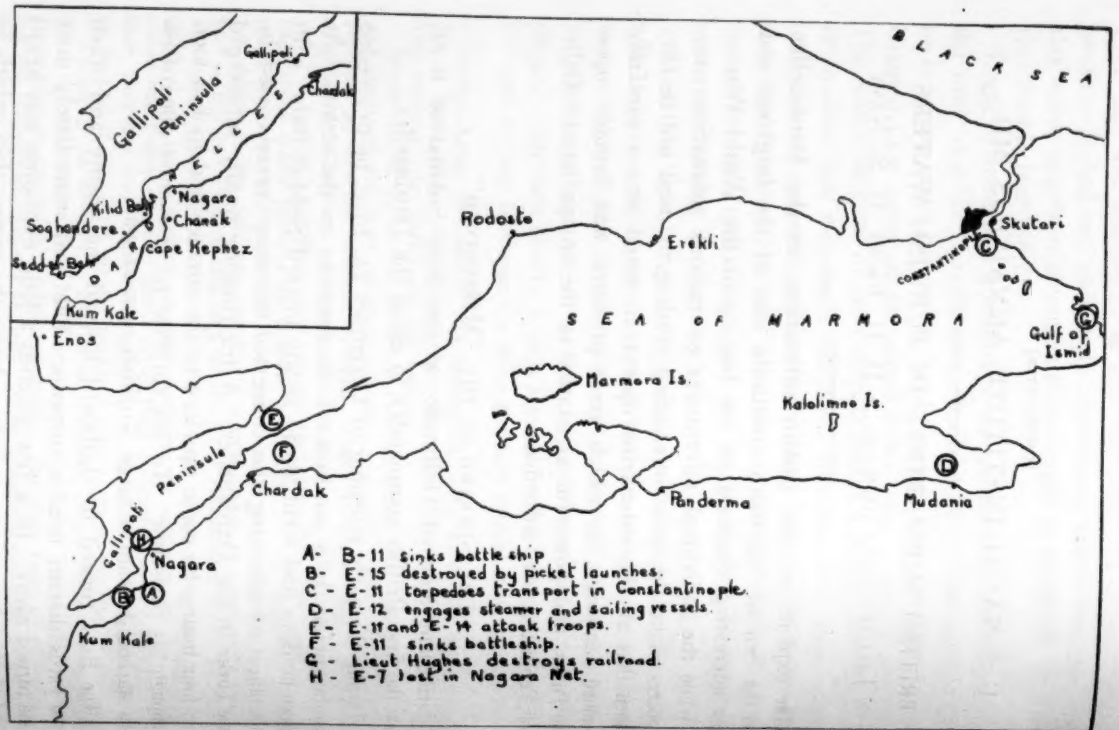
While the individual adventures of famous submarine commanders make the most interesting reading, it must not be forgotten that all the submarine operations fitted into a carefully planned campaign, in which great pressure was brought upon the Turks, and powerful assistance to the troops on the Gallipoli Peninsula was afforded.

The Sinking of the "Messudiyeh"

Lieutenant Normal Holbrook, in the little Submarine *B-11*, was the first British commander to enter the Dardanelles.

During the early morning of December 13, 1914, he proceeded on the surface to a position off the entrance to the straits. At dawn he dove and went ahead slowly toward Sedd-el-Bahr, with the object of attacking the converted merchant vessels used by the Turks in the Dardanelles. After running totally submerged for four hours, he came up close to the surface and took a look through his periscope. To his surprise he saw close aboard on his starboard beam a large Turkish man-of-war.

The *B-11* turned to starboard toward the enemy and when 600 yards distant fired a torpedo. The boat immediately dove and turned away. In a few seconds a loud explosion was heard and Holbrook came up to take a look; the enemy ship, which he recognized as the old battleship *Messudiyeh*, was firing her broadside battery in his direction. The submarine by this time had



THE DARDANELLES AND THE SEA OF MARMORA

acquired a little too much negative buoyancy, and before her commander could see any more, went down below periscope depth. By the time she could be brought up again it was seen that the battleship was sinking by the stern and that she had ceased fire.

Up to this time Lieutenant Holbrook had had no opportunity to fix his position, but now after swinging his periscope about for a careful look, he found that he was in Sari Siglar Bay, just south of the Narrows. Turning his boat around, he commenced his return trip; his compass at this critical moment became so blurred that it could not be read. This fact would have compelled the submarine to run continually with its periscope showing, but fortunately in a short time the compass was again in commission, thus permitting the boat to run completely submerged.

By 2:00 P. M. the *B-11* was out of the straits, having accomplished a brilliant feat and demonstrated that it was possible for a well-handled submarine to penetrate into the Dardanelles. Lieutenant Holbrook was awarded the Victoria Cross.

DESTRUCTION OF THE "E-15"

During the naval attack on the Dardanelles in the spring of 1915, submarines were used for reconnaissance in the straits. On the night of April 17, the evening before the great attack, *E-15* was sent into the straits to examine the minefield off Cape Kephez. The submarine ran aground immediately under the guns of a Turkish battery and her crew was taken prisoner before being able to destroy the boat.

In order to prevent the boat from being raised and used by the Turks an expedition to destroy her was organized for the following night. Lieutenant Commander Eric Robinson commanded the expedition. With him in the picket boat of the *Triumph* were Lieutenant A. B. Webb, R. N. R., and Midshipman John Woolley. Lieutenant Claud Godwin commanded the picket launch of the *Majestic*.

Under cover of darkness the two boats headed in toward the submarine, which was only about 300 yards from the enemy battery. Being discovered and covered with a heavy artillery fire, the *Majestic's* picket launch was sunk and one man killed.

The *Triumph's* boat, however, torpedoed and destroyed the submarine, picked up the crew of the other boat and retired without further loss, although no less than 200 rounds were fired by the fort during the action. Lieutenant Commander Robinson was promoted to commander for his gallantry in this daring enterprise.

An expedition which was almost exactly similar to the burning of the *Philadelphia* by Stephen Decatur was hardly to be expected under modern conditions. Nevertheless, naval warfare always follows the same lines, as was shown in the Battle of Jutland, when Vice Admiral Hipper boarded a destroyer and hoisted his flag on another ship in much the same way that Perry did at Lake Erie.

THE FIRST PASSAGE OF THE DARDANELLES

The Australian submarine *AE-2*, Lieutenant Commander Stoker, was the first boat to go through the Dardanelles. The boat started out just as the great landing attack on the Gallipoli Peninsula was being carried out.

At 2:30 A. M., April 25, 1915, the *AE-2* entered the straits on the surface. After running slowly for two hours, the enemy batteries on the northern shore opened fire and *AE-2* dove immediately to seventy feet. During the next half-hour many cables could be heard scraping along the ship's side.

When off Chanak, Stoker came up to have a look through his periscope. He immediately torpedoed a gunboat and dodged a destroyer which attempted to ram him. Then the compass went off and *AE-2* ran aground off Fort Anatoli Mejidieh. She came off easily and proceeded up the channel at ninety feet. This time the boat ran aground off the European shore and slightly damaged the hull. In getting off the boat was detected by the enemy and chased by numerous patrol vessels.

At 8:30 A. M., after six hours of adventures, Stoker decided to lie on the bottom near the Asiatic shore to allow the excitement to subside. He lay there undisturbed until 9:00 P. M., when *AE-2* came to the surface and charged batteries. At 4:00 A. M. she proceeded and during the early morning attacked two unknown men-of-war without success. At 9:00 A. M. the submarine entered the Sea of Marmora.

After four days of unsuccessful operations in the Sea of Marmora, *AE-2* was sunk by an enemy torpedo boat, all the officers and crew being saved. Although Stoker's cruise had been unsuccessful, he had won the honor of showing the British submarines the way into the Sea of Marmora, where they performed such famous exploits.

FIRST CRUISE OF THE "E-14"

Holbrook had shown the way into the Dardanelles, Stoker into the Sea of Marmora; Lieutenant Commander E. C. Boyle in the *E-14* was now to have the honor of being the first to carry out a successful cruise in the Sea of Marmora.

His adventures in the Dardanelles were similar to those of Stoker. At 1:40 A. M. of April 29 he started on his cruise. At 4:00 he was picked up by the searchlight at Soghandere and fired at by the enemy batteries. After diving under the minefield he came to the surface again and ran through the Narrows under a hail of projectiles.

Being compelled to dive by patrol vessels, he torpedoed a gunboat and passed Nagara. He gradually made his way through the straits being chased and fired at on numerous occasions by enemy destroyers and gunboats, one periscope being squarely hit by a shell.

The next afternoon two transports, escorted by three destroyers, were made out. Here was the first opportunity for attacking the Turkish water communications between Constantinople and the Gallipoli Peninsula, the principal task of the British submarines. Boyle succeeded in hitting one of the transports with a torpedo and saw her head toward the beach with dense yellow smoke pouring out.

During the first week of his cruise in the Sea of Marmora, Boyle had little further opportunity of attacking the enemy communications, as he himself was hunted almost continually by Turkish destroyers and patrol vessels. The smooth sea was a great handicap to him, as the wave made by his periscope could under these conditions be seen at great distances. The wake of torpedoes could also be seen and this permitted three patrol craft to avoid being hit.

On May 5 he hit a destroyer, but the torpedo failed to explode. During the next few days he chased numerous transports, and created a great moral impression on the Turks, although he had little actual success. On one occasion the *E-14*, while chasing a transport on the surface, got in so close that she was hit several times by the rifle fire of the troops. Finally on the evening of the tenth he fired two torpedoes at two enemy transports, escorted by a destroyer. The first torpedo missed, but the second hit and exploded with splendid effect, the transport sinking quickly.

On the thirteenth a small steamer was chased ashore and an action with rifles carried on with its crew.

On the seventeenth, all torpedoes having been expended, the *E-14* was called by radio, and successfully passed down the straits with the usual adventures.

The cruise of the *E-14* had been a very successful one, but it was demonstrated that, had even a small gun been mounted, much more severe losses could have been caused to the enemy.

The commanding officer was promoted and awarded the V. C., while the other officers, Lieutenant Stanley and Acting-Lieutenant Lawrence, were given the D. S. C.

FIRST CRUISE OF THE "E-11"

Immediately after the return of the *E-14*, another submarine, the *E-11*, went through the Dardanelles into the Sea of Marmora. Her commander was Lieutenant Commander M. E. Nasmith. He proceeded toward Constantinople and on the morning of the twenty-third torpedoed and sank a torpedo-boat anchored off the harbor. As the ship went down, her crew gallantly manned a six-pounder and destroyed the forward periscope of the *E-11*. A few hours later a small steamer carrying a 6-inch gun and ammunition to the Gallipoli Peninsula was captured and sunk. To close the day Nasmith torpedoed a loaded supply ship, drove a second one on to the beach and carried on an action with Turkish cavalry by means of rifle fire. It would hardly have been possible to crowd more action into a single day.

The next exploit of the *E-11*, was a direct attack on Constantinople. In full daylight she dove into the harbor and came up to periscope depth close to the American yacht *Scorpion*. Two

torpedoes were fired, one of which missed; the second, however, hit the transport *Stamboul* and blew a hole twenty feet wide at her waterline, so that she had to be grounded in shoal water. Although the submarine was covered with a hail of fire from the batteries, she dove and escaped without damage.

After carrying out various other operations Commander Nasmith passed out through the Dardanelles on June 7, after an extremely successful cruise. During the passage he "observed a large mine preceding the periscope at a distance of twenty feet, which was apparently hung up by its moorings to the port hydroplane." As the fire of the forts made it impossible to come to the surface, Nasmith was compelled to run on in this perilous situation until he was outside the straits. Then he blew his after tanks, sending his bow down. In this position he went full speed astern, and the mine fell off.

For this splendid cruise Commander Nasmith was awarded the Victoria Cross.

AN ADVENTURE OF THE "E-12"

On June 10 Commander Boyle started his second cruise in the famous *E-14*.

Nine days later Lieutenant Commander K. M. Bruce in the *E-12* came up and met him in the Sea of Marmora. On the twenty-fifth the *E-12* had her great adventure.

During the forenoon, while on patrol off Mudania, the submarine sighted a small steamer, towing two sailing vessels. Farther off was another steamer, towing three vessels. The *E-12* was the first boat to mount a six-pounder gun and now Commander Bruce determined to test it out in an attack on the surface. As he approached the nearest tow, the crew of the steamer stood on deck wearing life-belts and nothing appeared suspicious. Bruce ran the submarine alongside, and his first lieutenant with a few men boarded the steamer.

At this instant a Turk threw over a hand grenade, which hit the submarine, but fortunately did not explode. Then they opened fire with a small gun concealed in the after part of the ship and also with rifles. The British returned the fire with the six-pounder and rifles. While this hot action at ten yards range was going on, the two sailing ships in tow came up and their

crews also opened up with rifles. Finally, after the steamer had been hit ten times with six-pounder shells, the Turks surrendered, and Bruce proceeded to sink all three ships.

This accomplished, he headed in for the other tow. The second steamer ran on the beach and was supported by a gun on shore, but the *E-12* succeeded in setting her on fire, before being forced to retire.

THE "E-7's" ENGAGEMENT WITH A TRAIN

When the *E-12* was recalled on June 28, her place was taken by the *E-7*, Lieutenant Commander Cochrane, who soon demonstrated that he was one of the finest British submarine commanders. During his eventful cruise he sank no less than five steamers and sixteen sailing vessels. In one case he had to dive under a line of sailing ships to sink the 3,000 ton steamer *Bigo* while she was tied up to the pier at Mudania. Having made every kind of an attack on the enemy afloat, Cochrane decided that he must vary his operations by an attack on the Turks ashore.

On July 17 he emerged close in to the shore, where a railroad cutting was in easy range of his six-pounder. After destroying the cutting he proceeded along the shore to the eastward. Soon he saw a long train running in the opposite direction, that is, toward the destroyed cutting. He followed up the train and soon saw it returning toward him. The *E-7* then came up and opened fire. After twenty shots had been fired three ammunition cars blew up with a terrific explosion. Cochrane then went back to the destroyed cutting and, sighting another train, hit it several times before it could get out of range.

On July 24 Cochrane ran down through the straits, being twice held up in obstructions for over one half hour. Each time he managed to get clear by patiently maneuvering his boat. His cruise had been the finest thus far, both in actual results and in daring and coolness in emergencies.

On July 21 Commander Boyle had brought up the *E-14* for her third and most successful cruise. In three weeks he sank one steamer, one supply ship, seven dhows and thirteen sailing ships. He practically cleared the sea of Turkish craft, and forced the troops assigned to the Gallipoli Peninsula to go by train from

Constantinople to Rodosto, and thence to Gallipoli by a three days' march, instead of by a simple trip by steamer.

THE SECOND CRUISE OF THE "E-11"

On August 5, 1915, the *E-11* entered the Sea of Marmora for her second cruise in Turkish waters.

On this occasion the Dardanelles was passed without important incident and on the afternoon of the sixth *E-14*, Lieutenant Commander Boyle, was met at the appointed rendezvous. This was interrupted by a Turkish gunboat, which the *E-11* hit amidships with a torpedo and sank. The two commanding officers then drew up a plan of operations for the next day.

In accordance with the plan the two boats took up assigned positions along the European shore to the eastward of the city of Gallipoli to wait for Turkish troops and convoys marching toward it.

Twice during the morning the *E-11* sighted troops through her periscope, came to the surface, manned her little twelve-pounder gun, and dispersed the marching columns. Commander Nasmith then stood down toward the other submarine.

Early in the afternoon, both submarines saw dust clouds rising from the road along the beach, came up and opened fire. Commander Boyle fired forty rounds with his little six-pounder and Nasmith was able to do even more effective shooting, as he had the larger gun. The action was continued for nearly an hour, when the Turks brought a field battery into action, forcing the submarines to submerge. After patroling around for a while the *E-11* again came to the surface and carried out a brief bombardment before being driven down by the field battery. Two submarines had blocked the shore road for an entire day.

During the eighth both submarines patrolled the eastern entrance to the Dardanelles. The *E-14* torpedoed and sank a large supply ship; the *E-11* had the good fortune to sight the old battleship *Haireddin Barbarossa* proceeding under the escort of but one destroyer. Commander Nasmith skilfully maneuvered his boat into a good firing position and hit her full amidships with a torpedo. The ship, severely damaged, headed for the shore, but soon blew up and sank. Before going down the

Turks gallantly stood to their guns and kept up a heavy fire, which of course had no effect on the submarine.

The *E-2* now entered the Sea of Marmora to serve as the relief for *E-14*. While passing up through the Dardanelles the *E-2* had a very exciting adventure. Off Nagara the boat ran into an anti-submarine net. By looking out of the conning tower ports through the clear water a large wire hawser could be seen caught under the barrel of the gun, while a smaller cable was against the conning tower itself; still another had fouled the wireless standard aft. The captain, Lieutenant Commander David Stocks, had to maneuver around for ten minutes before he could get clear; during this time Turkish patrol boats threw down many bombs which exploded around the boat. Had these been the 300-pound depth charges which were used later in the war, the submarine would have had little chance of escaping, but the small bombs then used by the Turks had no effect. After getting clear a Turkish destroyer followed the boat for a long time, but Commander Stocks finally was able to get away. The Turkish destroyers were at that time none too eager to engage British submarines.

After a brief conference between the commanders of the two submarines it was decided that they operate singly for a week. *E-11* sank two supply ships and one collier during the first few days and devoted another day to firing at troops and convoys on shore. Commander Nasmith then conceived a bold plan of blowing up the important railroad which led from Scutari to Ismid. The submarine proceeded to Kalolimno Island, where a day was spent in constructing and testing out a raft; this was then lashed on the deck of the boat and it proceeded into the Gulf of Ismid toward the point selected for attack.

At about 2.00 A. M. the submarine was grounded at the foot of a steep cliff and Lieutenant D'Oyly Hughes started out on his perilous adventure. He swam ashore, pushing ahead of him the raft, which carried a large charge of guncotton for the demolition of a railroad bridge which was near at hand.

As Lieutenant Hughes walked along the track with his heavy burden, he saw three men sitting alongside it talking. Making a wide detour around them he reached the bridge, where unfortunately a fire was burning and a number of men were working.

It was evident that the original plan of blowing up the bridge was impracticable. Hughes therefore retraced his steps and discovered a place where the track crossed a slight hollow over a brick support. This was located only 150 yards away from the three men sitting by the track, and unfortunately it was necessary to fire a pistol to ignite the fuse of the demolition charge. Nevertheless, Hughes decided to destroy the track at this point, despite the fact that the Turks would be certain to hear the report of his revolver.

After firing the charge Hughes ran along the track, followed by the three Turks. The latter, of course, could not tell how many enemies they were in contact with and apparently did not push their chase very rapidly, because Hughes was able to keep them at a distance by firing his revolver. After running for about three-quarters of a mile, he ran down to the beach and swam off into deep water. At that time the demolition charge went off with a great explosion, sending a great mass of debris over the *E-11*.

When once out a considerable distance from the shore Lieutenant Hughes blew his whistle, but he was so far from his boat that it was not heard. He then made a daring decision to go in to the beach again. After getting a good rest he entered the water again and this time swam along the shore toward the *E-11*. Just at daybreak he rounded a point and saw the submarine. This time his whistle was heard and the boat headed toward him. But now the Turks were also alarmed and they covered the water around the swimmer with heavy rifle fire. Fortunately their fire was inaccurate in the dim light and the *E-11* picked up Lieutenant Hughes and dove to safety.

On the twenty-first the *E-2* was met at the appointed rendezvous and the boats commenced a second week of operations alone. During this time the *E-11* sank a tug, a sailing vessel and two large transports.

On the twenty-eighth the two boats met off Mudania and carried out a combined bombardment of the magazine and railroad station. On September 1 a number of hits were made on a railroad bridge and two days later the *E-11* left the Sea of Marmora, having an uneventful passage down the Dardanelles.

The cruise had lasted twenty-nine days, all of which had been spent in enemy waters. Commander Nasmith had carried out

every form of an attack which it was possible for a submarine to make. In addition to this, Lieutenant D'Oyly Hughes had performed a feat of such daring as has rarely been equalled in British naval annals.

"E-12" IN THE NAGARA NET

Lieutenant Lyon of the *E-2* now volunteered to repeat the exploit of the first Lieutenant of the *E-11*. For practice he swam in and destroyed two dhows during the night of September 7. The next night he started in with a raft and a guncotton charge to blow up a bridge, but an explosion on shore was all that was ever heard of the gallant officer, whose unfortunate expedition much resembled that of Lieutenant Somers of our own Navy in the harbor of Tripoli.

Commander Bruce of the *E-12* was the next to cruise in the Sea of Marmora, where he held forth for no less than forty days, during which time he sank such shipping as was still at large and amused himself by firing at a powder factory near Constantinople. His principal adventure, however, was his encounter with the Nagara Net on his return trip.

Running squarely into the net, the *E-12* broke off a part of it and towed it with her. The extra weight gradually carried the boat down, and to cap the climax a strand of the net jambed the forward hydroplane so that it could not be moved to bring the boat up.

Bruce immediately blew his forward tanks and gave her full speed, but still she went down to the great depth of 245 feet. The glass eye-parts of the conning tower crashed in, and the conning tower had to be cut off from the rest of the boat. The forward compartment also began to leak. As the storage batteries were in this part of the boat, this compartment also had to be closed to prevent the deadly chlorine gas from reaching the crew.

The boat was in this terrible situation for full ten minutes, but finally three men moved the forward hydroplane and the boat shot up to twelve feet before she could be steadied. She was now partly out of water and six patrol boats joined in the frolic by opening fire. Bruce got her down to fifty feet before being hit.

The compass went out of commission and only one depth gauge was left, but the *E-12* kept on at a depth which averaged about eighty feet. At Kilid Bahr she ran into another net, and Bruce in desperation went full speed. To his astonishment it came off and with it the old net also. This threw the boat out of control and her bow came out of the water. Numerous shore batteries and patrol vessels opened fire. One shell smashed the already ruined conning tower; several others hit the bridge; two torpedoes passed astern, but still the gallant *E-12* came on through the straits after probably the most extraordinary adventure experienced by any submarine. Her brave officers and crew deserve the highest praise we can give them.

THE END OF THE "E-7"

During November and December Commander Nasmith made his third and record-breaking trip in the *E-11*. This time he remained on his hunting ground for forty-eight days, in which he sank no less than forty-six ships, of which one was a destroyer and ten were steamers.

One of the last operations of the campaign resulted in the sinking of the *E-7* and the capture of her famous commander, Lieutenant Commander Cochrane.

At 6:30 o'clock one morning the *E-7* passed Kilid Bahr, running with periscope out. One hour later the buoys of the submarine net at Nagara were sighted. Cochrane dove to 100 feet and increased speed to seven and one-half knots.

The *E-7* ran full into the net; her starboard propeller fouled the cables and she swung around into the net broadside on, becoming completely entangled in it. A mine exploded near the boat, but did no damage.

From 8.30 to 10:30 A. M. Cochrane backed and filled in vain endeavors to get clear of the net, which now was caught to both the bow and stern of the boat. A second mine then exploded close to the boat, breaking electric light globes and causing other slight damage.

The coolness of the heroic captain is well shown by his plans at this time. "After the explosion the boat was much freer than before, and in the hope that further attempts to blow up the

boat might result in completely freeing her, I decided to remain submerged at a good depth until after dark, when it might be possible to come to the surface and clear the obstruction."

After 2:00 P. M. the reduced battery power of the boat made it necessary to give up further attempts to get clear. At 6:40 P. M. a mine exploded almost against the hull and this time severe damage was done. Once more the motors were started, but the boat was still fast.

As a number of boats were heard patroling above the submarine, it was evidently impossible to clear the obstruction after coming to the surface. Cochrane was therefore forced to the decision to come to the surface, destroy his boat and then surrender. The entire crew was rescued by the Turks; the *E-7* was blown up and sunk by a demolition charge, the fuse of which was lighted before the boat was abandoned. Cochrane made two attempts to escape from captivity. The first time he was retaken when only ten miles from the seacoast; the second time he got away after many exciting adventures.

DISCUSSION

The Part of Engineering in Command

(See Whole No. 240, Page 203)

REAR ADMIRAL W. V. PRATT, U. S. NAVY.—I have read with interest the article in the February number of the United States Naval Institute entitled, "The Part of Engineering in Command" by Rear Admiral John K. Robison, U. S. Navy. I have also read with interest the discussion of this article by Rear Admiral Henry B. Wilson, U. S. Navy.

The first point of interest that I note (and it seems to me a step in the right direction), is to place the article and the discussion in close proximity to each other or if there be more than one discussion to place the discussions immediately after the original article. In this way the reader gets the advantage of the various points of view. I should be glad to see this method followed in the future.

The next interesting point to me is the fact that there are two distinct points of view. One as represented by the author of the article and the other the point of view of the critic. If I may take the liberty of saying so, I think the truth lies somewhere between.

In reading Admiral Robison's article I did not get the impression that it was in the nature of a sales talk but I did get the impression that the Admiral felt that there was a need for the officers of the service to know the relationship existing between engineering problems and the problems of the higher command.

If Admiral Robison's article intends to imply that officers are not fitted for the higher command unless they have an intimate knowledge of the technical details of engineering I am inclined to disagree with him. If, on the other hand, he means that every man exercising high command should have a knowledge of the capacities and limitations of engineering and by the use of this knowledge be able to form accurate judgments; if in addition to what engineering knowledge he may have, he also has the ability to choose such men as may have the intimate technical knowledge that he requires, and knows how to use these men, then I am quite in accord with Admiral Robison.

There is a very definite need for officers exercising high command afloat and in administrative positions on shore to have a working knowledge of engineering problems, sufficiently accurate, so that their judgments may be sound. The broader problems of engineering are quite similar, that is, from the operating point of view, to those which are presented in the movements of troops and supplies and which are generally summed

up under the head, logistics. In the lower commissioned grades engineering problems are analogous to those presented by gunnery, navigation, and other similar tasks falling to the lot of the younger officer. It is quite as essential that the young officer should go through a course of practical engineering instruction afloat, as it is that he should go through the turret, be a watch officer, know the details connected with the plotting room, be familiar with the fire control or be conversant with the general duties of the officer of the deck. But as an officer grows older in experience, the technical side of his profession merges into a broader aspect, and when he arrives at high command, the qualities which are essential for him to possess, such as judgment, determination, decision, fearlessness to take responsibility, and general knowledge, can be gained by passing through any one of the earlier schools of experience; but undoubtedly, such an officer will not be as thoroughly grounded in his profession as if he had passed through all of the schools.

I wish nothing that I may say to be taken as meaning that the younger man should not take just as much interest in the engineering side of his profession as he takes in gunnery or in any other one of the tasks which fall to his lot. It is exceedingly important that he should be as thoroughly grounded in engineering duties as he should be in his other duties.

There is, however, a reason why in the problems of the higher command afloat, engineering has not received the prominence that it should. It will never receive the importance that certain other broader sides of a naval man's profession receive, nevertheless its importance must be appreciated. The reason for that, to my mind, is this: The average American mind, and the naval officer is no exception, is never content with receiving information, translating it into routine work, and giving out nothing more than a mechanical output. The genius of the American intellect is highly creative. The result of this is that when an officer reaches the higher command, if his bent lies in engineering work, his problems then are those of design, creation, and he will find his best efforts on shore. The navy has provided for that. On the other hand, the officer in high command afloat, finds that his most creative work lies in the field of strategy and tactics. He must have a working knowledge of engineering, in the same way that he must have a working knowledge of gunnery, but his task is that of the great co-ordinator, the maker of war problems, the inspector in chief, and the critic of the efforts of others. For these reasons I believe that the higher command afloat will always be more interested in the broader problems of his profession than he will be in the technical details of any one particular phase of his work.

In conclusion, I should like to state that I hope nothing will be taken as decrying the need of a thorough understanding of the capabilities and limitations of matériel, which for the officer afloat is his great engineering problem. On the other hand, while I am not convinced that post-graduate courses which take our younger men too far afield into the realm of engineering are a good thing for too many officers, I am thor-

oughly convinced that every officer should pass through the school of the engineer afloat.

The Part of Engineering in Command

(See Whole No. 240, Page 203)

CAPTAIN D. W. KNOX, U. S. NAVY.—The article of Admiral Robison is of more than passing interest and importance. It not only deals in the broad general problems with which the higher naval command will be confronted in war, but also shows their intimate relation to concrete engineering problems. The close and vital connection between engineering and higher command is thus made manifest; and herein lies the special value of the article, because of an unfortunate and increasing shortage of officers duly qualified in engineering—caused primarily by an erroneous belief that engineering duty is not an essential groundwork for high command.

Not many years ago the article of Admiral Robison's would have been regarded by the service at large as in conflict with the purposes of the War College—a cry from the material school of officers. Fortunately at the present time so many officers have taken the College course that no misunderstanding of this nature can exist. It is of course true that the College deals principally in the employment of an instrument—the naval establishment; but to assume the College to be so engrossed in employment as to be uninterested in the instrument itself is manifestly absurd. Indeed one of the greatest impulses toward perfecting the instrument springs from deficiencies made evident in employment.

Of late years the War College has given special attention to the subject of command, in which one of the most important elements is deemed to be the reaching of sound decisions quickly. Good technical judgment is a cardinal pre-requisite of a quick decision that will prove sound. Such technical judgment must include not only strategy and tactics, but also logistics—the maritime, engineering, and gunnery aspects of our profession.

The logistic judgment acquired by practical experience, which each officer takes to the War College, is an indispensable preparation for the work there. If that logistic judgment is deficient in engineering, the quality of the officer's work at the College will be seriously impaired; just as it would be if the judgment was deficient in seamanship or gunnery. Certainly no officer whose general judgment has been broadened by earning a College diploma will minimize the great value of engineering judgment, based on engineering experience, in conducting naval warfare.

"The Job"

(SEE PAGE 1915, WHOLE NO. 237)

CAPTAIN STANFORD E. MOSES, U. S. NAVY.—In the PROCEEDINGS of the Naval Institute there was recently published an article called "The Job": an essay dealing largely with the duties of division officers, and the conversion of raw recruits from civil life into the best type of men for the Navy.

Parts of that essay are helpful, and much that the author urges in the way of more careful and thorough indoctrination of new men is in the right direction; but exception must be taken to one suggestion offered.

The following comments upon the article referred to are not submitted in hasty criticism, but after discussion with some of the older and most experienced officers of the Navy, as well as with younger officers, petty officers and men. It is hoped by this discussion to neutralize or reduce to a minimum the harm which might result from any adoption of one particular suggestion offered by the author of "The Job." He offers four suggestions:

(1) A card index is recommended; to be kept by division officers, giving detailed information in regard to each man.

(2) This second suggestion relates to instruction by squad leaders and division officers.

(4) A board to examine undesirables is recommended.

The third suggestion is the one which seems fundamentally wrong. It is as follows:

(3) "All divisional officers to be in their rooms one (1) hour a day, at a specified time, to answer personal questions, investigate special cases or to confer with petty officers, as they may elect."

A discussion of this suggestion will be postponed until the others have been disposed of.

(1) A card index containing "complete information about every man, including a transcript of his current enlistment record, the members, ages and residence of his family and a rough log of his progress" would be an excellent thing. Duplicate service records have been recommended for similar use, and duplicate service records officially authorized, to be transferred with the man, would be more valuable than the card index recommended. The service record form is the result of many years of experience and provides for much valuable information regarding men. The condensed history shown on a service record would be of great assistance to division officers if properly understood and used. The front and back pages give the man's physical, personal and family history; his age, previous training or experience, his home address, next of kin, dependents or beneficiaries, and other information. Marks for proficiency and for conduct give at a glance the record previously made; while entries showing advancement in rating, meritorious conduct, offenses, special qualifications and details will help to give a fairer estimate of the man.

(2) The question of periods for divisional instruction under squad leaders and division officers is a matter of fleet or ship routine, and there seems no necessity for special recommendations in this matter.

(4) As to a Board for investigating the undesirability of "undesirables": It has been said that "Boards are wooden and long and narrow," but a careful investigation extending over a period of years leads to the conclusion that many men are discharged from the Navy as undesirable when more careful and painstaking investigation of their troubles might have saved good men for the Navy and made them better citizens. It should never be forgotten, and the experience of the Army in this respect is much the same, that men discharged for cause or as undesirable may greatly injure the reputation of the service. Naturally, a man who has been kicked out goes out with a sore spot. He will make the best of his case, even though he has a bad case. There are two sides to every question, and the point of view of the man discharged as undesirable, which is the point of view of his friends and family, places the blame upon the Navy if the circumstances can be so construed.

The real danger lies in the cases where the Navy is at fault and where the man has at least a measure of justification or right on his side.

This idea of a board to sift the cases of men reported undesirable or inapt has been tried with notable success in one of the largest and most successful business organizations in the world. In that organization a man may be "fired": but he is fired to an adjusting committee of selected men of experience and tact. He is not thrown out of the organization. Not one man in a thousand was discharged from that organization in the course of a year. With a Navy of one hundred thousand men this would mean less than one hundred men discharged for cause each year. Such a result would be a great increase in the economical and efficient handling of the Naval personnel.

In the large manufacturing company referred to, the committee hears the reason for the man's discharge; hears the complaint by the head of the department or foreman, and then hears the man's side of the case. The man is then given a trial in another department; and then in another department after that if he fails to satisfy again, and again.

There was an extreme case of one man who was dismissed fourteen times without ever leaving the organization; the man evidently finding a billet which suited him and in which he rendered efficient service, satisfactory to a foreman who was difficult to please.

There is a lesson for the Navy in this story. A board or committee is not recommended for a military service; but in the Navy there should be more patient and painstaking investigation of reported offenses, and more flexibility in the effort to adapt new men to a fitting rating and environment.

Men serving in their first enlistment should be afforded every reasonable opportunity to change their rating if they find themselves assigned to work for which they have no aptitude or in which the conditions are uncongenial. It is too much to expect of young men and boys from civil life that they

should invariably enlist in the Navy in the branch or rating best suited to their abilities and tastes; or in which they can serve to best advantage. Instances could be multiplied of men who joined the Navy to "see the world and learn a trade," and who became discouraged because they felt they were doing neither.

The promise of an opportunity to see the world is fulfilled more frequently than the promise of an opportunity to learn a trade. The Navy is very active, and recruits in traveling from their homes to a Training Station, and from Training Stations to their ships on the Atlantic, Pacific, Asiatic or Mediterranean stations see a good deal of the world. Exceptions are rare.

But in the matter of learning a trade it too often happens that a boy with a mechanical turn of mind is lashed to the handle of a swab by a boatswain's mate or division officer who refuses to spare him for transfer to the dynamo room, torpedo room, or carpenter's gang when the boy applies for a change. The inability to secure a change in rating has thrown many men out of the Navy or into prison. Every man so lost costs the Navy a thousand dollars or more. A thousand men discharged for cause or for undesirability or inaptitude means the loss of a million dollars. This money loss, great as it is, does not tell the whole story, or even the main part of the story. Dissatisfied men, if their discontent is allowed to fester, are rotten apples in the barrel. The infection of their contamination spreads to others with whom they come in contact. The cost in decreased efficiency due to discontent cannot be measured and the reputation of the Navy suffers from the bad impression given to the families and friends of the men discharged.

Coming now to the main point to which exception is taken in the article called "The Job"; the third suggestion offered in that essay was: "All division officers to be in their rooms one (1) hour a day, at a specified time, to answer personal questions, investigate special cases or to confer with petty officers, as they may elect."

Younger officers of the Navy should not by any mischance be permitted to accept that suggestion unchallenged. It should be asserted most emphatically that division officers should not receive petty officers or enlisted men in their rooms at a specified, or at an unspecified time; either to answer personal questions, or to investigate special cases, or for conference, or for any other reason.

The officers' quarters on board ship are their homes and cannot fittingly be used for consultation and conference with enlisted men any more than bedrooms and dining-rooms in the private homes of doctors and lawyers could properly be used for purposes of consultation and conference with patients and clients. The officers' quarters are their homes on board ship, and no effort should be spared to make them homelike and to foster among the members of each mess a friendly, family feeling, where the utmost freedom prevails.

Such a spirit would be destroyed if officers' quarters were made public highways and business offices. It is only a step from such a suggestion down to the condition of men coming in overalls or working clothes with papers, tools or gear; making the officers' quarters an annex to the office, deck or work-shop.

There are other latent evils in the suggested plan of having petty officers or men come to officers' rooms for consultation or conference. There is an undesirable element of secrecy about the whole proceeding. There is no need for such privacy in the relations between officer and man. Business should be transacted and work done in the places provided for business and work. An officer can take a petty officer or man to a vacant part of the deck, out of earshot but always within sight, and transact all of the confidential matters which need pass between them. The evils which would follow a general adoption of the suggestion to receive men in the officers' rooms are numerous and certain. This has been repeatedly proved by experience, and to forestall and prevent such evils no words of warning can be too emphatic.

There are exceptions to every rule, but as a rule the first time a man enters an officer's room should be after he wins his commission and is no longer an enlisted man, but an officer.

The handling of men, and particularly the handling of first enlistment men, is a matter of such vital importance to the Navy that a few suggestions gathered from thirty years' experience will be submitted as a substitute for the practice to which objection has been raised. Division officers should realize that advancement and promotion are often a matter of as much importance to a seaman or fireman as they are to an ensign or a lieutenant. They should remember that there is a constant flow of promotion among enlisted men, with new duties to which those who have been promoted must become accustomed before they can be expected to be highly proficient. At the bottom of the ladder of promotion there is a constant stream of recruits who are utterly ignorant of the customs of the service and who need their division officers' most careful attention, consideration, and direction; need their leadership.

It is rarely necessary to place a man on report. Division officers should realize that their commissions re-enforce their authority with all of the power of the Government of the United States. Without harshness or arrogance, but with firmness and justice, officers should be able to discipline their men ("to make disciples or followers of them") without appeal to higher authority. When an officer places one of his men on report he confesses, in the majority of cases, that he is unable to control the man, and is calling for help.

A fundamental truth which all young officers should learn is this: that the interests of the Navy are best advanced by advancing the interests of the individual man. No man is indispensable in any billet, and if one is refused transfer or a change in rating because he is needed in his present billet, such refusal is unjust to the man and penalizes efficiency.

When an office-holder was urged upon President Lincoln as the "only man for the job," Lincoln suggested that the job be abolished, as the man might die.

A man should not be held until a relief can be provided or because his services are required where he is, if the man himself would be benefited by transfer or change in rating. In the long run the best thing for the individual is the best thing for the ship and for the service, and "the job" for division officers is to know their men better than the men know themselves; to inspire them with interest and to encourage them at work and play.

Idleness and inactivity are the greatest enemies of discipline and efficiency. The man who works hard, plays hard, and gets his just deserts is usually the efficient, contented and self-disciplined man who goes steadily up the ladder of promotion.

The Navy education courses offer division officers many opportunities for the improvement and advancement of their men, and every division officer who adds a man to the list of those taking the educational courses adds something to his own value as well as to the increased efficiency of the man and of the Navy. The sum of little things like this may mount up to a surprising total. There is no surer proof of a division officer's capacity as a leader of men than the evidence of his ability to keep those who are under his command well occupied and interested in their work and ambitious for advancement.

Let every young officer who reads these lines ask himself the following question:

What are the advantages of an Honorable Discharge?

What are the requirements for an Honorable Discharge?

How many of your men were promoted last quarter?

How many tried for advancement and failed, and why?

What is the essence of every petty officer's obligation?

What is the schedule of punishment for the most common offenses; such as unauthorized absence for various periods, drunkenness and theft?

How many of your first enlistment men know this schedule?

What is the gist of the Oath of Allegiance, and what is its moral obligation?

What effect has conviction by a court-martial upon a man's service record marks for conduct, and in proficiency?

How many men in your division are qualified to date for Honorable Discharge?

How many of your men have no allotments registered, and why not?

If you cannot answer these questions and other questions affecting the welfare and efficiency of your men, look up the answers now. You cannot do justice to yourself or to your men unless these matters are at your finger tips and always in your thoughts when you are dealing with men. This is your "job"; the leadership of men.

The foregoing suggestions apply particularly to new men serving in their first enlistment, because they do not understand naval discipline and life in the Navy; nor do these new men clearly understand the reasons which underlie all orders and Navy Regulations, or the rewards and privileges which come from a clear record and for proficiency.

Napoleon said that every private soldier of France carried a Marshal's baton in his knapsack. Every first enlistment man in the Navy should be made to feel that the stars on his collar may some day be worn on his epaulets. To give him this feeling; to inspire subordinates with interest, pride, zeal and a desire to rise; to hold the standards of performance always higher, and to take as many of his men as possible over the high bars without a stumble or fall; but to put them all over with records reasonably clear: This seems to be the essence of the "the job" of the division officer in our Navy.

Merchant Marine Personnel and Navy Interest

(SEE WHOLE NO. 239, PAGE 71)

LIEUTENANT F. V. GREENE, U. S. N. R. F.—I have read, with interest, the article on the Merchant Marine and its relation to the Navy, by Captain F. E. Cross, U. S. N. R. F., published in the January PROCEEDINGS. It called forcibly to my mind certain facts which have an intimate bearing on the subject.

The Naval Reserve, as we know, is very necessary to the Navy in time of war, to man ships that are in excess of the number which can be manned by our Navy; and the members of the Reserve should be able to earn a living at sea in the way they have been used to.

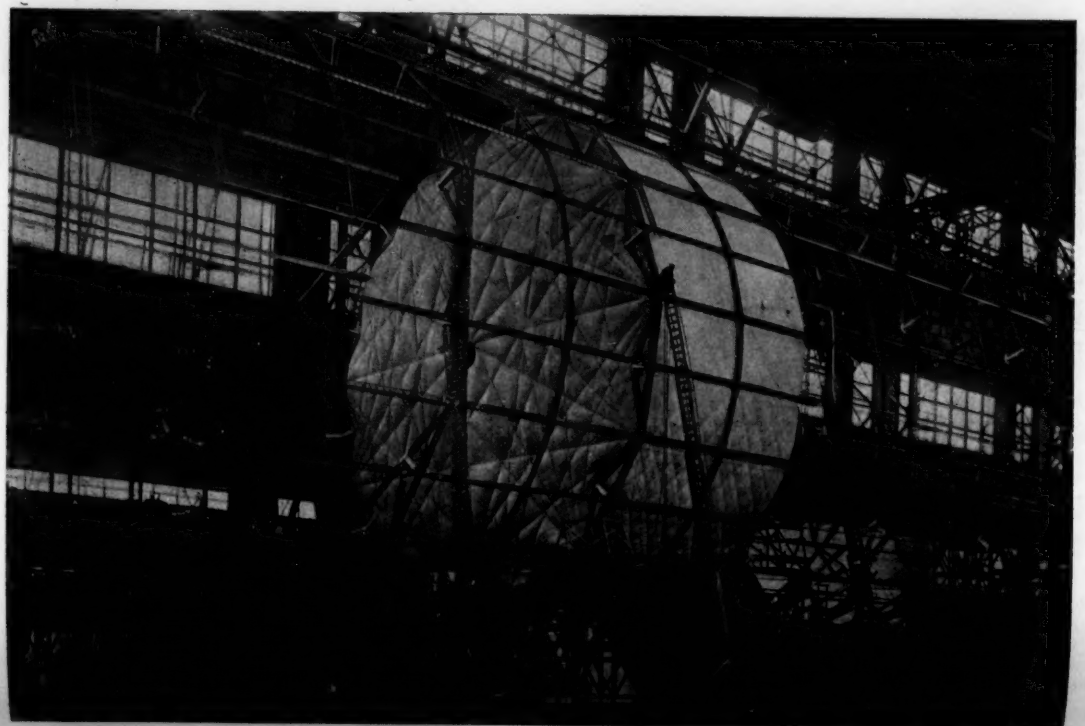
With the reduced size of the Merchant Marine, this is difficult, but it is made even harder by a prejudice which exists in many steamship lines against having American-born officers. In one line I have in mind, very few Americans will be found among the officers; and in the higher ranks, none at all.

The officials of the Company explain this by saying that American-born and trained officers are incompetent and cannot handle their ships or their machinery. All this is not only very unjust, but is entirely contrary to facts. It results, however, that this preference for foreigners throws many Americans out of employment. They are cut off from earning their livelihood on the sea, lose their touch with it, and with seafaring life in general. Thus, there is lost to the American Merchant Marine that class of American-born officers who would be so valuable if another war should come about.

In the late war, many un-naturalized aliens were commissioned in the Naval Reserve Force; and *after* being so commissioned, were taken down and naturalization papers taken out.

As a sidelight on the desirability of this situation, it is a well-known fact that many of these foreign officers ridicule the United States and its institutions; they believe, or affect to believe, that it is nearly impossible to get American-born and trained officers for the U. S. Navy in case of emergency (although there are many such who are qualified in every way); and they think it a great joke that the Navy is unable to fill up its ranks without having recourse to foreigners.

In the next war, the Navy will again need the help of a great number of seafaring officers. Will it always be able to draw these from the ranks of foreigners?



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PROFESSIONAL NOTES

PREPARED BY

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AND

LIEUTENANT J. B. HEFFERNAN, U. S. NAVY

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GREAT BRITAIN

THE NEW BATTLESHIPS.—Washington, February 16.—Full recognition of the increasing menace to surface warships of aerial attack is given by the British in plans for the two new battleships, the *Nelson* and *Rodney*, according to information just received through official channels.

Not only will the upper deck be heavily armored against aircraft bombs and dropping shells fired from long range at high angles, but two other decks, one at the top and the other at the bottom of main armor belt alongside, will furnish additional protection. These three armored decks, British experts believe, will furnish adequate protection against overhead attack to the ships' "vitals."

Not content with protective measures of this sort the accepted designs for the new ships provide for a quarter-deck unusually large and free from obstructions which will probably be used for airplanes to land on and take-off from. In addition provision will be made for carrying seaplanes as well so that the new fighting craft will in effect be a modified airplane carrier able to meet an air attack in the air independent of the fleet's additional air forces.

Latest detailed information about these "treaty battleships" shows that when completed within the next three years, England will have the most powerful fighting ships afloat. Original plans drawn for the proposed super-*Hoods* of pre-conference days have been utilized, construction experts bending their energies to cutting down the weight to the prescribed 35,000 tons, without losing offensive or defensive power, and without sacrificing more than absolutely necessary the speed factor.

The main batteries will consist of nine 16-inch guns as against the eight 16-inch guns of the *West Virginia* and *Colorado* our two battleships that are nearing completion. These guns will be mounted in three

turrets all forward. Two of them will be on the forecastle one firing above the other and the third just forward of the funnel leaving practically no astern fire but keeping the after deck space available for aircraft. The three turrets as well as the conning tower, will be heavily armored.

While the reduction in engine power to save weight will leave the new ships with a speed of about 23 knots, the engines will be oil burning, driven by turbines with reduction gears, giving them a greater cruising radius than any other British battleship, enabling them to operate more readily in the Pacific and in remote waters.

The contract price of these vessels is about six million pounds each, a sum considerably in excess of the cost of our latest warships. Taking into consideration the comparative cheapness of British labor, this sum will enable the constructors to use the best of material thus effecting great savings in weight, and to incorporate every modern improvement.

They will be 660 feet long, slightly larger than ours, and will have a secondary battery of twelve 6-inch guns and four anti-aircraft guns, with 21-inch torpedo tubes on the upper deck in triple tube installations. Hydraulic operation of the turrets and steering gear is provided for and the bulges for torpedo protection will be within the hulls.

The big guns will be the largest ever used in the British Navy, the biggest previously being the 15-inch guns on the *Hood* during the war. The new guns are modeled along the lines of those in our Navy and weigh about 130 tons each. Work on the guns, armor and the ships themselves is under way.—*United Press.*

THE NEW BATTLESHIPS.—Of course, the greatest interest of the month, as far as the British Navy is concerned, is the laying down of three ships, the two battleships allowed under the Washington Agreement and the mine-laying cruiser being built at Devonport Dockyard. At first, it was generally believed that the two capital ships would be modified *Hoods*, with several of the features of that super-ship sacrificed in order to keep their displacement within the 35,000 tons allowed, but now it appears to be practically certain that they will be battleships pure and simple. Of course, all details discussed are purely conjectural, for the Admiralty is still in favor of the policy of keeping all new ships very secret in spite of the lead set by the United States, but of all the numerous prophesies of their details which have been published—and their names is legion—the one which finds most favor with the service man is that they will have a displacement of 35,000 tons, a huge beam into which have been worked wonderful devices for protection against under-water explosion, a speed of twenty-three knots and an armament of nine sixteen-inch guns in triple turrets.

Presumably these turrets will be arranged two super-firing forward and one aft, just as they have been in earlier British ships, but it is not without interest to read of one naval architect suggesting that all three turrets should be mounted forward, rising in a gigantic pile to the foretop and leaving the astern fire to a powerful battery of six-inchers or five-point-fives specially arranged for salvo firing. The argument is quite logical, that war experience showed that British ships were usually forced to use their bow guns far more than any others, and that if a ship is pursued and in danger of capture it only requires a knot or two to be knocked off the speed of the enemy to enable her to make her escape without difficulty. Salvos of six-inch shells seem more likely to open up the bow-plating of a pursuing ship and so retard her speed than sixteen-inchers fired in pairs, and, in this particular case, there appears to be quite a lot to be said for the medium caliber gun for fleet work, pro-

vided its range is long enough. On the other hand, the mental picture of three triple turrets rising one above the other until they emerge into the fore-top is too horrible to be contemplated by anybody who thinks that a ship should have some elements of beauty.—F. C. Bowen, in *Our Navy*, 14 February, 1923.

CRUISER-MINELAYERS.—Considering the striking results which attended the use of mines by every naval belligerent in the late war, the soundness of the Admiralty's decision to build a ship specially designed for mine-laying is not to be questioned. H. M. S. *Adventure*, constructing at Devonport, is the first regular mine-layer laid down for the Royal Navy, but she is not likely to be the last. During the war many ships of other types were improvised for mine-laying, including the two Canadian Pacific liners *Princess Irene* and *Princess Margaret*. The former blew up with terrible loss of life at Sheerness, but her sister remains in the post-war fleet. She is of 5,070 tons, steamed 23 knots on trial, and carries 400 mines.

The monitor *M-31* has also been refitted for mine work, but her small dimensions, low speed, and limited capacity for storage disqualify her for anything but training or coast defense. Several of the destroyers equipped with mines during the war still retain their gear, and we have also a few submarine mine-layers. The credit for evolving the high-speed seagoing mine-layer belongs to Russia, which built the *Yenesei* and fitted out several auxiliaries for this purpose just before the war with Japan. The *Yenesei* committed suicide on one of her own mines, but not before some of the "eggs" she laid had taken heavy toll of the Japanese Fleet.

Greatly impressed by the rôle of the mine in this Far Eastern War, Germany proceeded to build improved replicas of the *Yenesei*. The *Nautilus*, of 1,970 tons and 20 knots speed, was launched in 1906, and the *Albatross*, a slightly larger and faster ship, a year later. The latter was disabled and driven ashore by Russian cruisers in July, 1915, on returning from a mine-laying expedition in the Eastern Baltic. In the second year of the war Germany laid down two small but very fast mine-laying cruisers, the *Brummer* and *Bremse*, which were among the ships surrendered at the armistice and subsequently scuttled at Scapa.

Beyond raiding a convoy they do not appear to have performed much war service, but the possibilities of the design were obvious, combining as it did a speed of some 31 knots with light side guns, and large storage space for mines. A ship of this type could be employed equally well for long-range mine-laying or ordinary light cruiser duties. Had Germany built more of these vessels and used them with greater boldness they must have caused serious embarrassment. From the particulars of H. M. S. *Adventure* which have been published in our columns she will apparently be a ship of great speed and good weatherly qualities. Even when a considerable percentage of weight has been deducted for mine storage—and the modern sea mine is rather a ponderous weapon—there should be an ample margin left over for mounting an armament much more powerful than that of the *Brummer*.

The post-war tendency in naval design is to equip a vessel for more than one branch of duty. For example, our latest light cruisers carry aeroplanes and a heavy torpedo armament, and the aircraft carrier *Hermes* with her powerful quick-firing battery, could hold her own in an artillery duel with an enemy cruiser. For service in the Narrow Sea a ship such as the *Adventure*, which is reported to have a displacement of 7,000 tons, would be needlessly large and expensive, but for operations oversea she represents an admirable type. What a mine-carrying ship of great steaming radius can do when working independently was demonstrated by the

German auxiliaries *Moewe* and *Wolfe*, which sowed their mines in areas far removed from the immediate war zone and caused us endless trouble. In our judgment, therefore, the building of the *Adventure* shows the Naval War Staff to possess more imagination and enterprise than it is usually given credit for.—*Naval and Military Record*, 10 January, 1923.

FRANCE

THE NAVAL PROGRAM.—Some complaint is being made of the delay in giving our orders to private shipyards in connection with the naval program comprising the construction of three cruisers of 8,000 tons, six destroyers of 2,400 tons, twelve torpedo boats of 1,460 tons, and six submarines of 600 tons, together with the transformation of the *Bearn* into a seaplane carrier. Private shipyards will build four destroyers and all the torpedo boats and submarines, but while work is being carried on actively at the arsenals, no contracts have yet been distributed amongst private builders, and it is complained that, apart from the utility of putting all the work in hand simultaneously, it is unfair to delay giving employment to men in the shipyards while those in the arsenals are specially favored. The official explanation is that the prices submitted by private shipbuilders are so much above the estimated costs that the Ministry of Marine cannot accept them without risk of incurring the displeasure of Parliament. At the same time no one knows what the ships are costing in the arsenals.—*The Engineer*, 2 February, 1923.

SUBMARINES AND COAST DEFENSE BATTERIES.—The French are throwing themselves heart and soul into the working principles of the Jeune Ecole, for which they have always had a taste since Gabrielle Charmes began his crusade in the eighties. At present it is their intention to build two big submarines of 2,700 tons submerged displacement, with high speed, big gun power, and general lines very much after the fashion of our own *K* type. Details of these ships are still lacking, but they will not be laid down until the latter part of this year at the very earliest, possibly not even then. One wishes the French luck in their experiment, but the experience gained by the Germans and ourselves during the war is that the construction of super-submarines is asking for a good deal of trouble and is likely to be so for some time to come until there is a radical change in design.

But if the French are running a certain amount of risk in the construction of submarines of under three thousand tons, what of the plan that has been put forward to construct a number of six thousand-ton submersible liners which are to be used for maintaining communication with the North African colonies in the most unlikely event of the surface of the Mediterranean being closed to French shipping? It is understood that the design of these ships has been prepared and is being considered by the ministry of marine, and bearing in mind the number of weird and wonderful designs that have been considered by the French Navy since the dawn of the ironclad era it is not by any means improbable. If they care to waste their time on this sort of thing it is presumably their business entirely, and, after all, it might produce some interesting scientific results, but few will consider that it has much chance in the realm of practical politics. The published idea is to use them as transports, but, working from the experience that was obtained from the blockade runner *Deutchland* and her trips to the United States, it would appear that the number of soldiers who could be carried across in this manner would be so small that, quite apart from technical difficulties in the matter of getting the ship to dive and handle properly, the experiment would certainly not be worth while.

Another interesting naval experiment of doubtful value that hails from France is the construction by the Naval Ordnance Corps of a very long range twelve-inch gun, which certainly "out Berthas Big Bertha" by streets. Details of the new weapon are still a trifle vague, but, apparently, the gun itself weighs ninety tons, while the heavy mounting brings the total weight up to well over two hundred. It will fire an eight hundred fifty-pound shell and will have a range of a comfortable fifty-five miles. There is not the least reason to doubt these details, for the French want a lot of beating when it comes to an engineering feat of this sort. They are going to mount these pieces in coast defense batteries to work in conjunction with the fleet of submarines which they may or may not build. The Germans bombarded Paris with their Big Bertha and did a good deal of moral and material damage, but they never quite knew where their projectiles were going to drop, and a city is a very much easier target than a fast raiding man-of-war, or even a fleet of transports. A range of fifty-five miles is a great advance in naval gunnery, but, at the same time, it is rather difficult to see what good the new gun is going to be for coastal work; if the French mounted these pieces on their inland frontiers it might be different.—F. C. Bowen in *Our Navy*, 14 February, 1923.

SUBMERSIBLE BATTLESHIPS.—The French Ministry of Marine now have under construction a submersible vessel of 6,000 tons displacement. She is really intended for the conveyance of troops between France and North Africa terrain in the event of hostilities, and should the Mediterranean be controlled by enemy craft. She will have accommodations for a battalion of infantry with all necessary supplies.

The biggest underwater vessels thus far completed were the German blackade runners of the *Deutschland* type. They had a submerged displacement of rather less than 3,000 tons, and were able to cross the Atlantic very comfortably, either on the surface or running for many hours under it, on their fuel endurance. Our own biggest submarines are the *K* cruisers, which are nearly 1,000 tons smaller. The disaster to *K*-5 two years ago gave rise to an impression that these boats were too big to be maneuvered with safety. But whilst there seems little reason to doubt that this unhappy craft collapsed under heavy pressure resulting from diving too deep, this was due not to any architectural defect, but to miscalculation or the temporary failure of controlling equipment.

No Limitations

The building of the French submersible, more than double the size of anything yet attempted in the way of submarine construction, serves to remind us that there is really no more limitation to dimensions than in the case of the surface craft. In the course of an address to the naval architects of the United Kingdom not very long after the conclusion of the war, Sir Eustace d'Eyncourt, speaking of the principles which had governed his design of the *Hood*, said that the submersible battleship was a perfectly feasible idea, but not worth while.

By this, of course, the Director of Naval Construction meant that the sacrifice of swift capacity to attack and resist, and the necessary compromise in armaments, armor, and propelling machinery, would so far place the submersible battleship at a disadvantage with the surface ship as to more than outweigh the ability to disappear. In reference to the traditional methods of sea warfare this is probably correct. But we are now in an era when new forms of fighting have to be reckoned with, and these may altogether negative the precept laid down by Sir Eustace d'Eyncourt four years ago.

The war of the future will be largely dominated by two factors which were in comparatively initial stage during the Great War. These are

aircraft and gas. I use the words "comparatively initial," because in no previous campaign had these methods been employed, and not with any idea of minimizing the devastating efficiency which had been attained in their use before the conclusion of hostilities. In military circles it is frankly preached that the next bg war will be a chemical war. There is not wanting evidence that the Admiralty believe a similar condition may extend to sea warfare.

Gas Warfare at Sea

Within the next few months an entirely new anti-gas equipment will be issued to the fleet, and leading ratings of "superior ability" are invited to volunteer for instructional courses up to the full numerical capacity of the anti-gas school. Now it does not need much effort of imagination to realize that the employment of gas projectiles—either in the form of shells or bombs—against a warship is fraught with very much more serious danger than in the case of open land fighting. For the poisonous fumes, permeating the fighting stations and general quarters of a vessel, would be a new and terrible form of peril to the normal risks of a naval action.

The ability to submerge would be the easiest and most effective antidote to such a menace. Indeed, submersion would probably be often unnecessary in the case of a ship able to do it, since she would obviously be hermetically sealed, and therefore gas proof so far as her interior was concerned.

Eluding Air Attack

Submersion as a means of eluding aerial attack may be regarded as of rather questionable value, since from an altitude of several thousand feet the shape of a hull under water would be discernible. But even so, a vessel some fathoms deep would form a very much more difficult and indeterminable target than a ship on the surface. As against this, of course, it is true to say that she could not employ her anti-aircraft weapons of defense.

It is probably too much to claim that a submersible battleship would be immune from submarine attack, since the submarine would work under the direction of aerial spotters. But that the risk in this way would be greatly reduced is beyond question. Periscope observation of a hull on the surface is a very different thing from blindly obeying wireless instructions.

The advantages of the submersible battleship, it will be observed, are all of the defensive order. Now defensive qualities, essential as they are in a ship-of-the-line, should form a secondary consideration to aggressive powers. These would undoubtedly have to be sacrificed in no inconsiderable degree in a vessel designed to plunge at will. One consequence of such a development would certainly be a great reduction in displacement. The British *K* boats, with their single 12-inch guns, are practically battleship monitors. Their precise tactical rôle with the fleet has never been defined, possibly because it is of too indefinite a character. Manifestly there are so many conceivable conditions under which the sudden appearance of a vessel armed with even a single heavy caliber weapon might prove a decisive factor that it is virtually impossible to determine limits to her uses.

Problems Ahead

Submersible battleships should prove of the utmost value in operations undertaken at a long distance from home bases. A squadron that could approach its objective unseen, and therefore unsuspected, might have every prospect of success, where a surface force would be merely

courting disaster. That heroic phrase, "The Nelson touch," is still occasionally used, but the submarine, the destroyer, the aircraft, and the mine combine to render such tactics in nine cases out of ten merely suicidal. Jellicoe showed a clear perception of this when he broke off the Battle of Jutland at nightfall.

The pause in the competition of sea armaments which has been brought about by the Washington Agreement is bound to have revolutionary effects upon big warship design. The problematical influence of aircraft attack and chemical warfare will have advanced a long stage along the road of practical determination before the great naval Powers resume the building of capital ships. That these factors will eliminate the capital ship altogether only a very small minority of professional opinion believes. But that they will profoundly modify the traditional ideas which are still embodied in her form seems reasonably certain. And the submersible battleship is very likely to be one of the expressions of the change.—Sir Herbert Russell in *Naval and Military Record*, 31 January, 1923.

THE NAVAL BUDGET.—1. If nothing intervenes, the Chamber will soon take up the Naval Budget, which is next in order on their calendar after that of the Beaux Arts. Discussion of the bill on naval arsenals has already given occasion for the Minister of Marine to set forth the broad lines of his naval policy. In the coming years the task of the Minister of Marine will be if not easy at least fairly simple. The war has left France without a navy and one must be created.

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8. Here is the right place to economize rather than on the things that make for comfort of the men, which still leaves much to be desired on board some of our ships. Life on board the ex-German cruisers is uncomfortable. They were built for short cruises in the North Sea, upon return from which the men rested in spacious barracks. Day and night we keep hundreds of men in narrow quarters where tuberculosis may thrive.

9. Likewise it were imprudent to seek to curtail the expense of sending men on leave. Our naval forces are concentrated in the Mediterranean. It is not right to expect men from Brittany to pay their own expenses to their homes on leave. We must not forget that re-enlistments are rare.

10. The Navy needs trained men, specialists. Propaganda films, introduced by M. Raiberti, should be shown in all schools in France. The effort made by the Ministry to organize the preparation of service in the fleet is not enough. The naval apprentices of the Navy League are too few. We should show the young men of our industrial centers, electricians, carpenters, and coppersmiths, the advantages of pay and career open to them on board our ships.

11. Vessels are building, but slowly. Credits made available for the naval program in 1922 have not been used. This is not economy; it is rather delay. The main thing is not today's navy, but tomorrow's. Ships in service today have hardly any use other than for the training of personnel. Technically the French Navy should be the first in the world. The naval school to be built in Brest for the tidy sum of 5,300,000 francs will, we hope, possess laboratories and scientific collections. The greatest scientists are available to the Navy, but money is lacking for science. In 1920 the English budget for scientific research amounted to ten millions; ours to a paltry million. Through the genius of Langevin, Pousselot, Becquerel, Perine, Holweck, Trillat and many others, the French

Navy was the first to discover taking soundings by means of sound waves (the application of which could have saved the *France*), the secrets of distant mechanical transmission of power micraphones, etc., but because of our poverty we were unable to apply them.

12. More even than material means, we lack clear and sane ideas. For instance we see millions wasted on dirigibles. Valuable for ocean traffic, they are possessed of all the virtues except ability to flight. The War Department has given them up. The Navy still believes in them. Has the latter forgotten the serious losses in Zeppelins experienced by Germany, and the recent admission by Commander Strasser in the *Marine Rundschau* (April, 1922), he being the chief of the dirigible service. In 1918 dirigibles passed their apogee; planes, the remarkable organization of English artillery made their attacks so difficult that only on very rare occasions were satisfactory results accomplished by the dirigibles. On August 10, 1918, the *L-Z-76* was brought down in less than an hour by a plane. Tomorrow every light cruiser will carry planes. Hereafter the average altitude for fighting planes will be 8,500 meters, while that for dirigibles is 8,000; and the latter makes only 120 kilometers per hour as against the planes 250 km. Once overtaken the dirigible is an easy prey, doomed to disaster. The Naval Committee was quite right in refusing to buy or build a successor for the *Dixmude;* it has cost too much already.

13. Other expenses are pressing; soon the whole fleet will be burning oil. We lack storage and tankers. All large foreign navies have made extensive experiments in launching bombs from aircraft onto ships under way. On their point Parliament has no right to hesitate; our Navy does not own a dozen modern naval planes. And in submarines we are no better off. For years to come we shall be well within the figures which our friends deigned to allot us in Washington. Certainly the Minister did well to include in the 1923 Budget a first credit of three and one-half millions for the study and production of a motor of 5,000-6,000 h. p. During a long period of years the Germans spent millions of marks on motors, which all but won the war for them.

14. Renovation, both administrative and intellectual, scientific research, construction of an air fleet and a submarine fleet, those are the essential tasks. The 1923 Budget is a step on the way; but is still all too modest.

—*Le Temps, Paris,* 13 December, 1922.

FRENCH NAVY NOTES.—The French decision to altogether give up battleship-building will have as natural counterpart a gradual strengthening of the French submarine fleet which the wear and tear of war and the absence of practically any new construction since 1914 have had the effect of considerably weakening. Submarines are essentially fragile; ten years form the limit of useful longlivity for most of them, especially those under 600 tons. In Admiralty circles it is estimated that of the fifty submersibles on the active list of the Navy less than half are worth relying upon for a prolonged campaign. Since the War Gallic constructors have been taught by hard experience to be extremely exacting in the matter of submarine robustness, both in what concerns hulls and motors. Boats surrendered by the Boches have been sometimes derided by our ingenieurs on account of their coarse workmanship, but at least they had one quality sterling in war: viz., they were made to stand rough and prolonged usage at sea. At the present moment there is in commission a total submarine displacement of 30,000 tons, of which only 10,000 tons are considered to be available for warfare on the high sea. Building there are 11,000 tons, projected there are 12,000 tons (voted by the Chamber), and 35,000 tons are besides contemplated so as to make up

within a decade at most 65,000 tons of ocean-going submarines, in addition, of course, to 25,000 tons smaller submarines for coastal duties, making altogether 90,000 tons.

During the last few years the submarine problem has been the object of methodical and persevering attention, by means of laboratory researches and comparative experiments, and as a result the latest French submersibles of 1,100 tons, especially the *Joessel* and *Fulton*, have proved satisfactory in every respect, realizing an advance in the matter of reliable and economical propulsion, and also of habitability, over the best German-built submarines now in French hands. Creusot-Carrel motors of 1,500 horsepower have proved a gratifying success, especially when are remembered grievous disappointments experienced with former French-built Diesel motors before and during the war. The *Fultons* do 16 knots at sea with ease, and are good for a 11,000 miles radius, and with their eight torpedo tubes and their ten torpedoes of 18-inch diameter, plus two 75-mil. guns, they would prove dangerous opponents. The *Callot* and *Chailley*, just completing (932-1,300 tons, 3,000-horsepower, four bow tubes, thirty mines), mark a further progress. This complete mastering of the submarine motor problem means the opening of a new era in French submarine developments.

Post-war tests and war data combined led Paris experts to the belief that fighting qualities, habitability, radius of action, together with robustness and durability, require a minimum displacement of 1,200 tons, and regret is expressed at the inclusion in the Guist'hau program of smaller boats of 600 tons. The 1,200-1,500-ton submersible will probably be the standard French under-water type for years to come (3,000-horsepower, 16 knots, eight tubes of twenty-two inches, twelve torpedoes, 7,000 miles radius of action, fuel and stores for a thirty-day cruise). For experimental purposes two boats of 2,700 tons are to be put in hand next year, to have speed and gun power as well as a powerful torpedo armament. Colonial defense is what submarine designers have at heart to ensure—a thorny matter indeed over which discussion is raging in competent quarters. Safe communications to be maintained with Algeria, Senegal, Congo, Madagascar by means of 3,500-ton submersible cargo boats, and of 6,000 submersible liners, for which plans are ready by Ingenieur Simonnot and others. Since France can lay no claim to the mastery of the surface, under-water and aerial communications must at least be ensured to her. The successful experiment of the *Mediterranee* dirigible over and round Corsica have revived the demand for naval dirigibles.

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The 8,000-ton *Primaugute, Dugauy-Trouin*, and *Lamotte-Piquet* are steadily proceeding toward the launching stage at Brest and Lorient, but owing to belated improvements the motors have only just been ordered at St. Nazaire and at La Seyne. The total horsepower at forced draught will exceed 116,000, and the speed ought easily to reach 35 knots. Care has been taken to increase the all-around robustness so as to beat all actual records in the matter of cruiser sea speed.

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France's ballistic proficiency is attested by the batteries of extremely powerful and otherwise efficient 18-inch guns that will command this spring her most important strategic passages and approaches to her main naval bases. These weapons, that are vastly superior to any type of gun afloat and have maintained the French lead for shell destructiveness, possess, of course, naval value on account of their range, high velocity, and accurate fire, especially since the patient researches and combined experiments by *canonniers and officers d'artillerie navale* have solved the

problem of night firing, with both Admirals Salaun and Lequerré have been for months past studying with such will and method. To this substantial advantage for caliber the new 230-ton 340-mil. monster gun, just delivered by the Ruell naval gun factory, is adding superiority of range, as this French experimental "Bertha" will fire a 600-kilos shell at distances exceeding seventy-five kilometres (forty miles)—twice the range of ordinary naval guns—but with a degree of accuracy far superior, it is expected, to that displayed by the Boche supercannon that bombarded Paris. The qualities of the steel and thickness of the new gun, shortly to be tried at Gâvres, make it certain that the range could be safely extended. The question of wear and tear alone limits the trial range. The projectiles are, besides, for use on land.—J. B. Gautreau in *Naval and Military Record*, 17, 24, and 31 January, 1923.

GERMANY

RECORD GERMAN SHIPBUILDING.—The measure of our ignorance as to what progress Germany has really made toward the recovery of her economic strength since the war is indicated by some figures just published in Brassey's *Naval and Shipping Annual* on the authority of Sir Westcott Abell, Chief Ship Surveyor of Lloyd's Registry. Until lately it was quite impossible to obtain accurate statistics concerning the output of new tonnage from German yards owing to the secretive methods practiced there. It was known, of course, that those establishments were hard at work, but the revelation of what they have done is positively astounding. Sir Westcott Abell is now in a position to announce that the German shipyards in 1921 turned out no less than 1,714,300 tons gross, as compared with 135,000 tons in 1919 and 440,000 tons in the last pre-war year, and the total production for 1922 is believed to be as large as, if not larger than, that of 1921. Before the war German's shipbuilding capacity was estimated at half a million tons per year. In view of the supposed chaotic condition of her financial and industrial system since the war it would have been sufficiently remarkable had she been able to build anything like as much as this today. In fact, however, she has contrived to more than treble her pre-war rate of production.

Now, as shipbuilding is an expensive business, even when labor charges are low, this gigantic output of new tonnage proves that Germany, notwithstanding her plea of poverty, has plenty of cash to spare for everything but reparation payments. Apart from that question, Sir Westcott Abell's disclosure makes it perfectly clear that Germany is well on the way to becoming our most formidable competitor both in shipbuilding and sea traffic generally, and will soon be pressing us much harder than the United States is ever likely to do. Moreover, this enormous expansion of her shipbuilding resources means that Germany, when free to reconstruct her shattered naval power, will be potentially more dangerous than she was before the war. Her capacity for producing, say, submarine tonnage is now at least thrice as great as it was in 1914. The idea that Germany will remain indefinitely a negligible factor in the naval situation is, therefore, quite illusory.—*Naval and Military Record*, 10 January, 1923.

GERMAN NAVAL PROGRESS.—Since the reduced German naval and military forces were brought, on grounds of economy, under a single authority, the Ministry of National Defense, it has become almost impossible to ascertain how the funds voted were distributed between the two branches. Together, in 1922, they absorbed 6.40 milliards of paper marks, which were officially reckoned to have an external value of (at 1:70) of 91,420,000 gold marks (approximately £4,571,000). The same services

cost, on the estimates of 1914, 1,879,000,000 gold marks (nearly £93,950,000). In a comment on the whole Budget, Dr. Arnold Brecht, a director in the German Home Office, refers to the enormous shrinkage of expenditure on the Army and Navy. He compares the total outlay with the British outlay on the Air Service, which he sets at over £10,000,000, and with the relatively enormous expenditure of England and France. He adds that the cost of the Armies of Occupation is to Germany yearly 1.6 milliards of gold marks, being approximately £80,000,000. These are Dr. Brecht's figures. His object is to show how little Germany can do for her own defenses and how much she is compelled to pay for the maintenance of other armies. The most really useful work of the German Navy last year was in the training cruises of the *Berlin* with young officers and men, first to Swedish waters, and afterward through the Kattegat and Skagerack to visit the Norwegian coasts and ports. The ship's company were reported to have profited by the experience and to have shown much seamanlike quality.—*Army, Navy and Air Force Gazette*, 27 January, 1923.

JAPAN

BUDGET AND PERSONNEL.*—The Japanese Budget for the next fiscal year is freely criticized by the Press as "militaristic," owing to the large proportion of expenditure which it allots to defense. Out of the total estimated disbursements of 1,350,000,000 yen, army appropriations exceed 200 millions, and naval costs amount to 286 millions, these two items together thus accounting for more than thirty-five per cent of the total. Economists point out that the reduction of the Army Estimates by forty-seven millions is due less to actual retrenchment in that service than to the withdrawal from Tsing-tau, by which measure over twenty millions have been saved; and a further nine millions is temporarily economized by postponing the purchase of new equipment, which will have to be acquired sooner or later. The reduction of naval expenditure is considered disappointingly small in view of the Washington agreement. A considerable portion of the sums saved by stopping battleship construction has been diverted to the building of smaller men-of-war. On the whole, however, the financial burden of defense has undoubtedly been lightened, for, while armaments absorb thirty-five per cent of the new Budget, the corresponding percentage in last year's Budget—framed before the Washington decisions were known—was as high as forty-nine per cent.

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One effect of the reduction in personnel consequent upon the scrapping of so many old ships will be to increase still further the preponderance of volunteers in the Japanese Navy. For some years now the percentage of volunteers has stood at seventy-five. Under the new scheme of retrenchment about 10,000 ratings are to be discharged, and the annual quota of conscripts will be considerably reduced, while voluntary enlistment is to continue at the present figure. At an early date, therefore, from eighty to eighty-five per cent of the personnel will be volunteers, and in a few years' time the whole Navy, it is anticipated, will be manned on a voluntary basis, with the exception of stewards and carpenters. Training methods have been much improved during the past year, and some of the money saved on new construction has been spent in bettering the facilities for drill and instruction in the shore establishments and training-ships. Larger appropriations have been made for gunnery and torpedo practice, anti-submarine and mining operations, and scientific research. It is claimed,

*Reports in the press indicate that the enlisted strength of the Japanese Navy on January 1, 1923, was about 65,500 men.—EDITOR'S NOTE.

therefore, that the future Navy, though numerically weak in comparison with the two leading fleets abroad, will be maintained at a higher standard of war-readiness than ever before. The elimination of the conscript element will also raise the average length of service, as volunteers enlist for six years, as against a three-year term for conscripts. Japanese naval authorities are known to be anxious to increase the period of service to eight years, and this will eventually be done if circumstances permit. Naval service is said to be as popular as ever, applicants for enlistment being sufficiently numerous to enable a high standard of intelligence, physique, and character to be maintained. Discipline has, if anything, improved of late years; the relations between officers and men leave little to be desired, and cases of insubordination are extremely rare.—Hector C. Bywater in *Naval and Military Record*, 17 January, 1923.

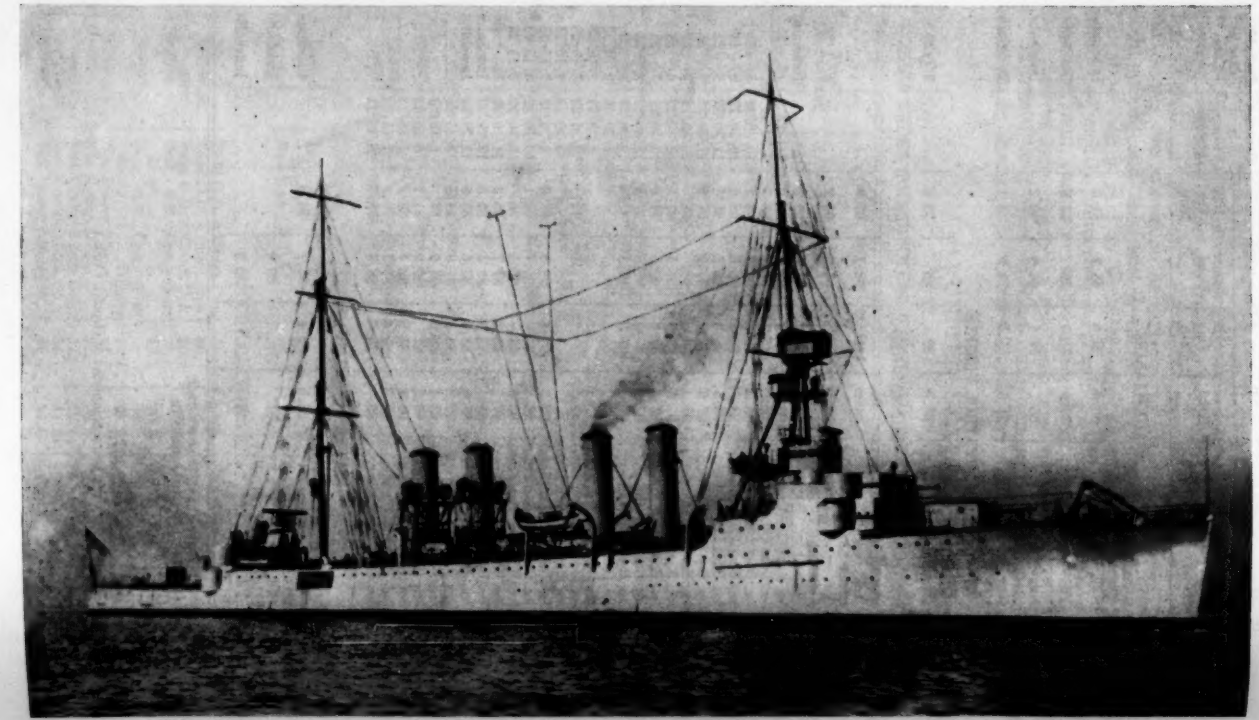
UNITED STATES

VESSELS UNDER CONSTRUCTION, UNITED STATES NAVY—Progress as of January 31, 1923

Type Number and Name	Contractor	Per cent of Completion				Contract date of Completion	Probable date of Completion
		February 1, 1923 Total	February 1, 1923 On Ship	January 1, 1923 Total	January 1, 1923 On Ship		
BATTLESHIPS (BB)							
45 *Colorado*	New York S.B. Cpn.	95.6	95.6	95.1	95.1	.....	8/1/23
47 *Washington*	New York S.B. Cpn.	.....	.....	.....	.....	.....	Suspended
48 *West Virginia*	Newport News S.B. & D.D. Co.	87.5	86.4	87.	85.9	.....	9/1/23
49 *South Dakota*	New York Navy Yard	.....	.....	.....	.....	.....	Suspended
50 *Indiana*	New York Navy Yard	.....	.....	.....	.....	.....	Suspended
51 *Montana*	Mare Island Nvy. Yd.	.....	.....	.....	.....	.....	Suspended
52 *North Carolina*	Norfolk Nvy. Yd.	.....	.....	.....	.....	.....	Suspended
53 *Iowa*	Newport News S.B. & D.D. Co.	.....	.....	.....	.....	7/12/23	Suspended
54 *Massachusetts*	Beth. S.B. Cpn. (Fore River)	.....	.....	.....	.....	7/12/23	Suspended
BATTLE CRUISERS (CC)							
2 *Constellation*	Newport News S.B. & D.D. Co.	.....	.....	.....	.....	.....	Suspended
4 *Ranger*	Newport News S.B. & D.D. Co.	.....	.....	.....	.....	.....	Suspended
5 *Constitution*	Philadelphia Nvy. Yd.	.....	.....	.....	.....	.....	Suspended
6 *United States*	Philadelphia Nvy. Yd.	.....	.....	.....	.....	.....	Suspended
AIRPLANE CARRIERS (CV)							
2 *Lexington*	Beth. S.B. Cpn. (Fore River)	36.7	27.2	36.3	26.7	.....	Indefinite
3 *Saratoga*	New York S.B. Cpn.	29.3	26.8	28.9	26.4	.....	Indefinite
SCOUT CRUISERS (CL)							
4 *Omaha*	Todd D.D. & Const. Cpn.	99.4	99.2	99.3	97.7	8/1/21	3/1/23
5 *Milwaukee*	Todd D.D. & Const. Cpn.	99.	96.	98.9	95.8	12/1/21	5/1/23
6 *Cincinnati*	Todd D.D. & Const. Cpn.	90.8	87.1	90.3	86.8	7/1/22	7/1/23
7 *Raleigh*	Beth. S.B. Cpn. (Fore River)	82.3	70.7	81.3	69.2	8/1/21	Indefinite
8 *Detroit*	Beth. S.B. Cpn. (Fore River)	97.1	93.6	96.9	93.3	11/1/21	4/1/23
9 *Richmond*	Wm. Cramp & Sons Co.	97.7	95.5	97.4	95.	.....	5/1/23
10 *Concord*	Wm. Cramp & Sons Co.	92.	88.5	91.5	87.	.....	7/1/23
11 *Trenton*	Wm. Cramp & Sons Co.	68.	59.5	67.5	58.	10/1/21	Indefinite
12 *Marblehead*	Wm. Cramp & Sons Co.	54.	43.5	53.5	42.	1/1/22	Indefinite
13 *Memphis*	Wm. Cramp & Sons Co.	48.	36.5	47.	35.	4/1/22	Indefinite

Type Number and Name	Contractor	Per cent of Completion				Contract date of Completion	Probable date of Completion
		February 1, 1923		January 1, 1923			
		Total	On Ship	Total	On Ship		
	AUXILIARIES						
Repair Ship No. 1	*Medusa* (AR1) Puget Sd. Nvy. Yd.	89.4	82.6	88.9	81.9	.....	Indefinite
Dest. Tender No. 2	*Dobbin* (AD3) Phila. Nvy. Yd.	76.5	76.3	76.	75.8	.....	Indefinite
Dest. Tender No. 4	*Whitney* (AD4), Boston Nvy. Yd.	66.1	59.4	65.9	59.2	.....	Indefinite
Sub. Tender No. 3	*Holland* (AS3) Puget Sd. Nvy. Yd.	21.5	5.5	21.5	5.5	.....	In definite
	PATROL VESSELS						
Gunboat No. 22	*Tulsa* (PG22) Charleston Nvy. Yd.	89.6	82.	86.	78.9	.....	9/1/23
	SUBMARINES						
116 *S-11*	Portsmouth N. H. Nvy. Yd.	Comm.	1/11/23	98.1	97.9	.....	.....
117 *S-12*	Portsmouth N. H. Nvy. Yd.	96.5	96.	96.2	95.7	.....	4/ 1/23
118 *S-13*	Portsmouth N. H. Nvy. Yd.	94.8	92.9	94.6	92.6	.....	Indefinite
123 *S-18*	Elec. Boat Co. (Quincy)	98.6	98.6	98.6	98.6	7/1/22	10/-/23
124 *S-19*	Elec. Boat Co. (Quincy)	Comm.	1/6/23	98.7	98.7	9/30/22	.....
126 *S-21*	Elec. Boat Co. (Quincy)	98.2	98.2	98.2	98.2	10/30/22	5/-/23
127 *S-22*	Elec. Boat Co. (Quincy)	98.6	98.6	98.6	98.6	10/30/22	9/-/23
128 *S-23*	Elec. Boat Co. (Quincy)	98.5	98.5	98.5	98.5	11/30/22	9/-/23
129 *S-24*	Elec. Boat Co. (Quincy)	97.9	97.9	97.9	97.9	11/30/22	5/-/23
130 *S-25*	Elec. Boat Co. (Quincy)	98.	98.	98.	98.	11/30/22	6/-/23
131 *S-26*	Elec. Boat Co. (Quincy)	97.5	97.5	97.5	97.5	12/30/22	6/-/23
132 *S-27*	Elec. Boat Co. (Quincy)	97.6	97.6	97.6	97.6	12/30/22	7/-/23
133 *S-28*	Elec. Boat Co. (Quincy)	97.5	97.5	97.5	97.5	12/30/22	8/-/23
134 *S-29*	Elec. Boat Co. (Quincy)	97.5	97.5	97.5	97.5	1/30/23	8/-/23
x135 *S-31*	Elec. Boat Co. (San Fran)	.....	.....	.....	.....	1/30/23	2/20/23
x137 *S-32*	Elec. Boat Co. (San Fran)	.....	.....	.....	.....	2/28/23	2/10/23
#139 *S-34*	Elec. Boat Co. (San Fran)	.....	.....	.....	.....	2/28/23	3/10/23
#140 *S-35*	Elec. Boat Co. (San Fran)	.....	.....	.....	.....	3/30/23	4/10/23
141 *S-36*	Elec. Boat Co. (San Fran)	99.5	99.4	98.8	98.6	9/20/22	2/15/23
142 *S-37*	Elec. Boat Co. (San Fran)	96.	95.	95.1	94.1	10/10/22	4/15/23
143 *S-38*	Elec. Boat Co. (San Fran)	97.5	97.	96.5	96.	10/30/22	3/15/23
144 *S-39*	Elec. Boat Co. (San Fran)	87.7	85.3	87.7	85.3	11/19/22	Indefinite
145 *S-40*	Elec. Boat Co. (San Fran)	85.4	82.5	85.4	82.5	12/29/22	Indefinite
146 *S-41*	Elec. Boat Co. (San Fran)	87.6	85.2	87.6	85.2	12/29/22	Indefinite
153 *S-42*	Elec. Boat Co. (Quincy)	92.2	86.5	91.9	84.8	5/15/23	.....
154 *S-43*	Elec. Boat Co. (Quincy)	93.4	88.5	93.2	87.	6/15/23	.....
155 *S-44*	Elec. Boat Co. (Quincy)	90.2	82.	89.9	81.1	6/15/23	.....
156 *S-45*	Elec. Boat Co. (Quincy)	91.1	83.5	90.7	82.2	7/15/23	.....
157 *S-46*	Elec. Boat Co. (Quincy)	89.5	80.4	88.7	79.1	7/15/23	.....
158 *S-47*	Elec. Boat Co. (Quincy)	89.	79.6	88.5	78.7	8/15/23	.....
	FLEET SUBMARINES						
163 *V-1* (SF4)	Portsmouth N. H. Nvy. Yd.	36.8	36.4	35.1	34.6	.....	Indefinite
164 *V-2* (SF5)	Portsmouth N. H. Nvy. Yd.	31.	.....	30.9	.....	.....	Indefinite
165 *V-3* (SF6)	Portsmouth N. H. Nvy. Yd.	31.	.....	30.9	.....	.....	Indefinite

Authorised but not under construction or contract:
Destroyers—(12) Nos. 348 to 359 inclusive.
Transport—(1) No. 2.
Fleet Submarines—(6) Nos. 166-171.
Neff Submarine—(1) No. 108.
Hull complete—Engineering work only.
x Hull complete—Engineering work being completed at Groton, Conn.



Scout Cruiser "Omaha"

TREATY TO GOVERN WARSHIP REFITTING.—Plans of the navy department to modernize thirteen dreadnaughts could be carried out only after it had been determined that no violation of the naval limitation treaty would be involved, under a provision of the omnibus naval bill approved today by the House by a vote of 48 to 3.

As approved by the House the provision of the bill says:

"Subject to the terms of the treaty providing for the limitation of naval armament. . . . the Secretary of the Navy is authorized to incur obligations to the extent of $6,500,000, to be paid as appropriations may from time to time be made for such materials and work as may be necessary for increasing the elevation and range of the turret guns of the following named battleships:

Florida, Utah, Arkansas, Wyoming, Pennsylvania, Arizona, Oklahoma, Nevada, New York, Texas, Mississippi, Idaho and New Mexico.

As originally proposed the provision would have authorized the alterations to the ships without any reference to the treaty, but Chairman Butler of the Naval Committee offered the substitute to meet objections of members that a violation of the treaty might be involved.—*New York Times*, 17 February, 1923.

TRIAL RUN OF U. S. S. "OMAHA."—Washington, D. C., February 27.—The U. S. Navy Trial Board will convene on January 30 at Tacoma, Wash., to supervise the preliminary acceptance trials of the scout cruiser *Omaha* highest powered vessel ever built for the U. S. Navy.

The *Omaha* was built at the plant of the Todd Shipyards Corporation and is the first of ten vessels of her type to be ready for her tests. The trial run will be over the Vasbon Island course in Puget Sound and will last over a period of six hours.

These new cruisers are comparatively a new type, at least as regards steaming radius and high speed. The most noticeable features of the designs as compared with contemporary navies are their high speed of 35 knots, their displacement of 7,500 tons and their batteries of twelve 6-inch guns. They are practically exaggerated destroyers, for with a beam of 55 feet and a mean draft of 13 feet 6 inches, they are 556 feet in length overall, giving a ratio of beam to length of one to ten.

A remarkable feature of the *Omaha* is the enormous power of the four Westinghouse turbines that propel her. When operating at full capacity, these engines will develop a total of 90,000 horsepower. Never before, on land or sea, has so large an amount of power been installed in so small a space. The turbines of the *Majestic*, the largest steamship in the world, develope 100,000 horsepower, but the *Majestic* is nine times larger than the *Omaha;* while the *Olympic*, which is seven times larger than the scout cruiser, is propelled by engines of only 60,000 horsepower.

However, the *Omaha* needs 90,000 horsepower only when she is tearing through the water at the express-train rate of 35 knots, or forty-two miles an hour. For ordinary cruising speeds of from 12 to 15 knots, a few thousand horsepower is amply sufficient. In order to avoid operating her big engines at so small a fraction of their rated capacity, four small cruising turbines are provided. These cruising turbines can be coupled to the propellers when desired and drive the ship at the low speeds with excellent steam economy.

An interesting novelty, at least in the United States Navy, is the adoption for the first time of the tripod mast, at the head of which is located a closed director-fire position, from which the fire of the battery of twelve 6-inch guns will be controlled. A second battery will consist of two-3-inch fifty caliber aircraft guns and two three-pounder saluting

Scout Cruiser "Omaha"

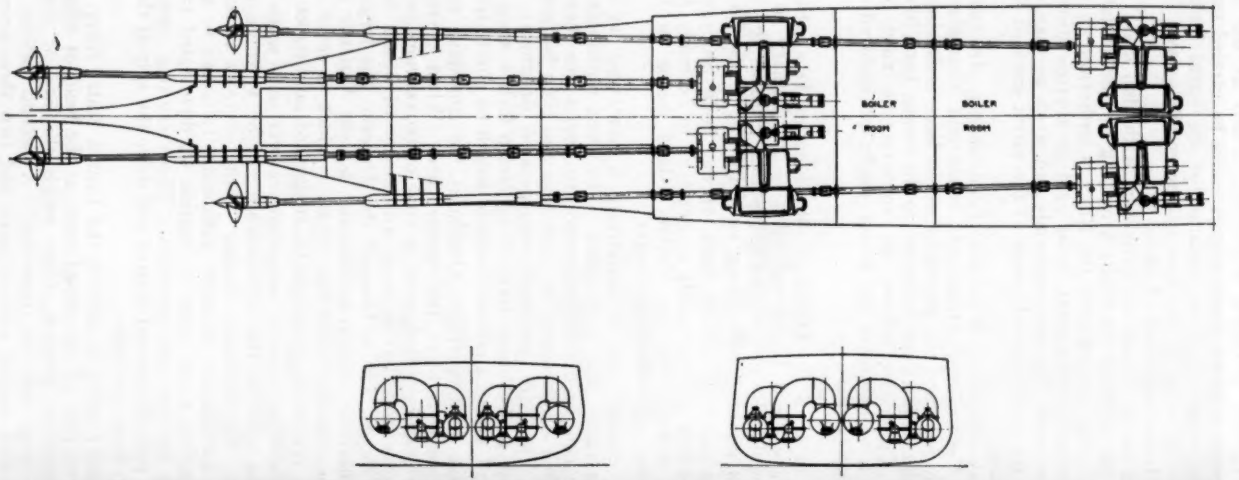


Diagram of Westinghouse Turbine Propelling Machinery for
U. S. S. "Omaha"

guns. The vessels will carry two 21-inch twin torpedo tubes, which will be located on either beam on the main deck between the aftermost funnel and the main mast.—Printed in *New York Times,* 28 January.

"SEATTLE" TO BE FLAGSHIP OF UNITED STATES FLEET.—The cruiser *Seattle* has been officially designated as flagship of the United States Fleet under command of Admiral Hilary P. Jones. The *Seattle* is being fitted out at the Puget Sound yard and officers and crew of the *Connecticut* now going out of commission there will take over the new ship. Quarters for the admiral and his staff and additional radio facilities and boat storage are being added. The ship will sail for the south April 1 to join the fleet. The ship will be used as an administrative flagship as the *Columbia* was used before taken back by the shipping board.—*The Naval Monthly,* February, 1923.

REPORT OF ARMY COMMITTEE ON STRENGTH OF NATIONAL GUARD.—The Secretary of War has approved the report of the Committee called for the purpose of studying the question of National Guard strength.

* * * * * * *

That the present approved plan for the organization of the National Guard is sound in principle and that the development of the National Guard under the plan and the approved policies of the War Department by the Militia Bureau is proceeding in a satisfactory manner, subject to the limitations imposed by funds appropriated by the Congress and by the States.

That taking into account the financial and economic situation now confronting the States and the United States, the maintenance cost of various strengths, and the amounts heretofore appropriated and that may be appropriated in the near future by the States and by the United States, it is necessary and in the best interests of all concerned, that the further development of the National Guard within the United States should be predicated upon a minimum peace strength of 250,000.

That the strength above indicated is the minimum that should be considered or that will permit the National Guard to accomplish its mission in the National Defense as contemplated by law and in War Department policies and plans. The strength indicated should be reached as soon as practicable and certainly not later than June 30, 1926.

That sound principles of organization and plans for the employment of the National Guard on mobilization in the event of a national emergency demand that whatever strength is maintained, that it be organized and developed into a homogeneous, well balanced and effective force, to the end that upon mobilization it may be employed as such without reorganization, or changes in character of units. The strength above indicated, 250,000 men, will permit of the maintenance of the following organizations within the United States, which should be developed in the order of priority stated:

(a) *At peace strength,* subject to modifications as shown below:
1. Eighteen Infantry Divisions.
2. Four Cavalry Divisions.
3. One hundred thirty Companies Harbor Defense Troops.
4. Twelve Infantry Regiments, Special Allotments.

(b) *At maintenance strength,* subject to modifications as shown below:
1. The combat elements of Corps, Army and G. H. Q. Reserve troops now organized or in the process of organization.
2. Special allotments to States.
3. Certain units necessary to complete a balanced force.

MERCHANT MARINE

THE SHIP SUBSIDY BILL.*—Washington, February 16—The Administration Shipping bill was restored tonight to its former place as the unfinished business of the Senate, after having been laid aside since early in the week to allow consideration of the British debt settlement legislation. This was done on motion of Senator Jones of Washington after advocates of the measure had demonstrated their superior strength by voting down, 38 to 30, a motion by Senator Robinson of Arkansas to adjourn.

The vote on adjournment was not regarded as an accurate test of the strength of the forces supporting and opposing the Shipping bill, as several Senators on both sides were absent.

Although the future of the subsidy bill in the Senate has not been clearly indicated in the face of claims and counter-claims on the possibility of its passage, it was said at the White House today that President Harding would not call a special session of Congress to consider the merchant marine situation if the Shipping bill should fail.

Mr. Harding was said to feel that the necessity for action looking to a solution of the shipping problem had been clearly demonstrated, and to have reached the decision that if the Shipping bill is not enacted the Government will proceed at once to take such steps as will diminish in a very great degree the present losses of the Government's fleet.

Detailed reports on the operation of Shipping Board vessels, showing net losses on individual voyages running as high as $100,000, had been studied by the President and his advisers, it was said, and the consensus of opinion was that the losses would be wiped out under the necessary economics which would follow the return of the shipping to private ownership.—*New York Times,* 17 February, 1923.

"NATIONAL SECURITY AND DEFENSE OF OUR COUNTRY."†—The usefulness of a Navy to a nation is not limited to the actual time of hostilities, but exists in time of profound peace because of its restraining influence on nations which respond only to force.

As an instance of the futility of merely setting an example, I cite the condition of our Merchant Marine. To take up this subject may seem a digression, but it is not since the Navy and the Merchant Marine are so dependent on each other as to constitute one element of the nation's power.

I do not wish to be considered as in any way criticizing but I would like to give you a plain sailorman's point of view of the condition of our Merchant Marine and then leave it to you to judge. The act under which our Merchant Marine is struggling was written by an able and well-known statesman from Wisconsin with the president of the International Seamen's Union sitting at his elbow. The avowed object of the latter gentleman was to raise the standard of living of sailors of the world—by our example—with what result?

On June 30, 1914, just before the outbreak of the World War, there were only 1,066,000 gross tons of American shipping registered for foreign trade, out of a total tonnage of 7,928,000 gross tons in the American Merchant Marine—all but these register ships being engaged in coastwise commerce. These 1,066,000 gross tons of shipping registered for foreign commerce were in 1914 carrying only 9.7 per cent in value of that commerce. On June 30, 1922, the American tonnage registered for

* Opponents of the Bill established a filibuster which finally killed this important legislation without its ever having been voted on.—EDITOR'S NOTE.

† Abstracts from an address delivered by Admiral Hilary P. Jones, U. S. Navy before the National Republican Club, New York, on 20 January, 1923.

foreign commerce, including the war-built vessels of the Shipping Board, amounted to 10,720,451 gross tons, carrying 34.6 per cent of our commerce.

But it should be borne in mind that since the end of the war there has been a steady decline in the proportion of American imports and exports conveyed in American vessels—the figures being 42.7 per cent in 1920, 39.8 per cent in 1921 and 34.66 per cent in 1922—that is, in the fiscal year ending June 30, 1922.

That is to say, the American participation in our country's own carrying trade, which reached a maximum of 42.7 per cent in 1920, is now falling at a rate that will very soon leave us as weak and helpless on the ocean as we were in 1914, unless some vigorous measures are taken to prevent it.

We are at a disadvantage in three points—(1) Our foreign sea-carrying competitors are in possession of the field, with organizations of their own all over the world; (2) all foreign governments in some form to some degree, subsidize their shipping—either all of it or a part of it—and aid their vessels also in other ways by discrimination against their competitors; (3) American ships, as a rule, pay substantially higher wages and provide more and better food for their officers and seamen than do foreign ships. That is to say, on American ships both wages and subsistence costs are greater than on foreign ships of the same kind, in the same trade. The wage cost of the crew of an average American cargo ship is 40 per cent more than the wage cost of a British ship of the same tonnage and general character. This difference in wages alone, to say nothing of subsistence, amounts to about $1,000 a month, or $12,000 a year, or 4 per cent on the capital cost of a 10,000 deadweight ton cargo steamer purchased from the Shipping Board at a rate of $30 a deadweight ton—the price now obtainable.

As to the seamen's law of 1915, it does impose certain discriminations against American ships from which their competitors are free. But that law does not in itself make American ship wages higher than foreign ship wages—for American ship wages were just about as much higher than foreign wages before 1915 as they are now.

The La Follette law has tended to weaken discipline on American ships and been more harmful than it has in any increase in the American wage rate. Contrary to a popular impression, the La Follette law does not require that a certain proportion of the crews of our ships be American citizens. It does require, however, that 75 per cent of the crew in each department shall be able to understand the language of the officers.

Another provision of the La Follette law provides that no men shall have the rating of able seamen unless they have been at sea three years on deck. This is a longer period than is necessary, and the requirement itself in effect discriminates against young Americans in favor of foreigners—as was doubtless intended by the International Seamen's Union, which brought about the enactment of this law, for of the members of this union at that time fully 90 per cent were foreigners.

Of the personnel of our merchant marine, 47 per cent in the overseas and long-voyage coastwise trade now represents American citizens, native or naturalized—the native Americans heavily predominating. This, however, includes the officers below the rank of master.

Of our actual seagoing merchant marine in the overseas and ocean coastwise trade on December 1, 1922, 1,966 vessels, of 5,826,000 gross tons, were of private ownership, and 1,642 vessels of 7,429,000 gross tons, belonged to the Shipping Board. In this Shipping Board fleet, however, a large amount of defective tonnage not of present commercial value

is included—so that probably the privately-owned and the government-owned tonnage of our actual serviceable seagoing fleet are practically equal in amount.

SEA TRAINING.—In this issue of *The Nautical Gazette* Professor Sukawa, of the Imperial Government Nautical College of Tokio, contributes an exceptionally important paper on the sea training of officers for the merchant service of Japan.

The following points are of special interest to us:

Ten local nautical institutes are maintained by the provinces—each independent and supported by appropriations of the provinces and by students' monthly fees.

There are two Government nautical colleges.

Course in the institutes six years, three ashore, three afloat.

Course in the colleges, four years.

Optional naval training in the institutes.

Required naval training in the colleges.

The insistance on training in both sail and steam.

The recognition of higher training by commissions in an established naval reserve.

Boys from all parts of Japan have a competitive chance for such sea training.

It may be of interest to compare the systems of training at present in being in the United States.

Three schoolships, small craft approximating a thousand tons displacement. Supported jointly by the Federal Government and the States of Massachusetts, New York and Pennsylvania.

These schools rank about equally with the institutes in Japan. The course is two years as against six in Japan.

We have no higher merchant nautical training schools.

All American boys do not have a chance to go to a nautical schoolship.

This privilege is reserved to boys who reside in the States of Massachusetts, New York and Pennsylvania.

If a boy residing in New Jersey, for instance, desires training for the sea, he is barred from the schools. The same, of course, holds good throughout the other States not in possession of schoolships.

We have no similar naval reserve provision to encourage those taking schoolship training.

The three American schoolships *Newport, Nantucket* and *Annapolis*, are doing excellent work and schoolship graduates hold an honorable position in our merchant marine, but the present facilities are inadequate, the training is too short, and the opportunities for training are too limited.

Shipowners, underwriters, and all other far-sighted Americans must be concerned in this matter. If we are to continue at sea successfully we must provide for sea training available to American boys from all parts of the country.

The present number of graduates from the schoolships are not sufficient to fill the vacancies in the lower ranks under normal conditions. It is a credit to our native ability that we do so well in spite of our lack of systematic sea schooling.

Concise and authoritative information, such as that given us by Professor Sukawa, is of the greatest value.

Every nation of Europe devotes patient effort to the training of officers and seamen for their merchant fleets. Great Britain has eighteen schoolships, Germany has eight. The more important countries of South Amer-

ica have schoolships for naval and reserve officers where their future commanders are educated. The whole tendency of this system is to create a body of men having expert nautical knowledge, useful either in the pursuits of peace or the business of war.

Not only do the schoolships of all nations teach navigation, but languages and a special academic course designed to fit graduates for intercourse with the peoples of the world. These graduates emerge with a training that places them far above the mental level of the old-time ship's officer, who steered in accordance with a system of navigation that may have been effective but which could only be learned by the hard route from fo'castle to a master's cabin.

American boys of today who have the mental equipment desired in an officer should be given an equal opportunity to adventure and to do service on the sea. It may be expected that the new generation of American ship officers will be a credit and an asset to the flag.—*National Gazette*, 27 January, 1923.

UNITED FRUIT FLEET CONVERTED TO OIL BURNING.—With the conversion of the steamships *Santa Marta* and *Zacapa*, now in progress at the plant of the Robins Dry Dock and Repair Company, the United Fruit Company will complete its program of converting all steamships operating out of the Northern Divisions from coal to fuel oil burners.

The United Fruit Company's fleet equipped for burning oil by the Todd Shipyards Corporation includes the following vessels: *Toloa, Calamares, Pasores, Tivives, Carrillo, Metapan, Santa Marta, Zacapa, San Jose, San Mateo, Limon and Esparta.*—*Nautical Gazette*, 10 February, 1923.

ENGINEERING

THE MARINE DIESEL ENGINE.—At the beginning of 1923 we are faced on every side with evidence of the increasing importance of the marine internal combustion engine, which we do not hesitate to say will prove a dominating factor in British marine engineering of the future. If marine engineers were slow to appreciate the early developments of the internal combustion engine this new form of prime mover to the propulsion of seagoing vessels, it cannot be said that such development has been neglected in recent years. In the years immediately prior to 1914, and throughout the war period, advances were made, especially in the building of the submarine type of engine, which familiarized many engine builders with the peculiar difficulties of marine oil engine practice. Since 1918, the greatest progress has undoubtedly been made in the construction of standard engines for cargo ships. The motor liner of moderately large power is now an accomplished fact, and we are already within sight of the large naval vessel propelled by internal combustion engines. The interest and enthusiasm for the marine oil engine and the problems inseparably connected with its design, construction and operation are well reflected in the papers which are read before the technical institutions. This is particularly noticeable in the case of the institutions immediately associated with the engineering and shipbuilding industries on the Tyne and Clyde.

The first meeting of the North-East Coast Institution of Engineers and Shipbuilders this year was devoted to a review of different types of marine internal combustion engines, and the Council of the Institution is to be congratulated on the response made by various engine builders and the variety and completeness of the schemes put forward for discussion. It was perhaps hardly to be expected that one particular size of cargo vessel would fit in equally well with the standardized production of every engine builder, but altogether seven schemes were submitted,

and with the exception of two noted types of four-cycle engines the list is complete. The difference in type is marked, for two designs of four-cycle machinery, three designs of two-cycle machinery, and two opposed-piston engines are represented. With the exception of the Vickers proposal the horsepower of the engines are singularly equal; they do not vary more than from 1 to 2 per cent, and the machinery weights show a corresponding regularity. In general, the saving in weight compared with a similar steam engine installation appears to be about 15 to 17 per cent. The familiar cylinder ratio between the two-cycle and four-cycle types is apparent, the former type of engine requiring only four cylinders, and the latter six cylinders for a given output. With the Doxford proposition the number of cylinders is reduced to three, but the weight and size of the engine is not very different from that of the other types. The cylinder diameter varies from a minimum of 21-in. up to 29-in. and the relation of bore to stroke approaches in some cases the 1 : 2 ratio which has been so successfully used in Scandinavian cargo ships fitted with Burmeister and Wain type engines. These long-stroke engines are now also built by Harland and Wolff. Throughout, a comparatively low speed of revolution is retained, and the speeds vary from ninety-five to 112 revolutions per minute, ninety-five revolutions being the mean. The question as to the overload capacity of the engine has in most cases been answered, and the two opposed-piston engines and the Scott-Still engine are most favorable in this respect. In the latter case the assistance of the steam side of the cylinder is very clear, and is shown in the high mechanical efficiency—88 per cent—which is claimed. The 82 per cent for the Doxford engine is a remarkable good figure, and so is the 78 per cent given for the Vickers engine. In most other cases a more conservative figure varying from 73 to 75 per cent is given. Turning to the fuel consumption, here again striking equality is shown, the figures given only varying between 0.386 lb. and 0.43 lb. of oil per brake horsepower-hour for the main engines alone. When the auxiliaries are added a wider difference is noted, but this in many cases is explained by the difference in the size and powers of auxiliaries put forward. Several makers have availed themselves of the opportunity of including a scheme with electrically operated auxiliaries. In most cases the weights for the steam and electric schemes are about equal, but it is safe to say that the cost of the electrical equipment is much higher. Where a donkey boiler is installed there is a marked tendency to use steam turbine-driven blowers and pumps. This is perhaps only natural considering the familiarity of the seagoing engineer with such machinery, but it behooves the electrical manufacturer to meet the demand for a high-speed marine type of motor, especially for turbo-blowers. In the case of the Armstrong-Sulzer proposal, we note that in the scheme with electric auxiliaries the scavenge pump is arranged on the main engine to avoid the necessity of fitting a high-speed motor-driven scavenge blower. It is stated that at the present time some difficulty is being experienced in connection with a British-built motor of this particular type. There is little doubt that this question will be dealt with in the discussion of the review. A point of interest is raised by the replies given to the question of using boiler fuel oil continuously. Although experiments have shown that there is no real difficulty in burning heavy oils of this type over prolonged periods, there is certainly great danger of pistons and liners becoming scored by particles of ash and of deposits forming, which for their removal will entail more frequent overhauls and attention. This is a matter which might well engage the attention of oil companies, with a view to removing these detrimental qualities from standard fuel oils. A matter affecting the shipbuilder and the registra-

tion societies is the revision of the rules for the size of machinery space to obtain the reduction from the gross tonnage. The diminution in engine room length is particularly noticeable in the Scott-Still scheme, where the difference between the length required and that shown on the standard drawing is about seventeen feet.

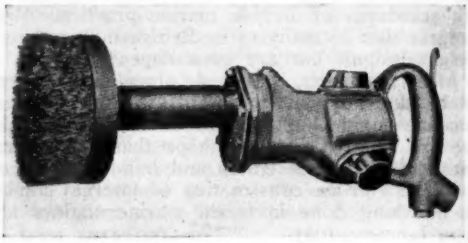
Speaking generally, the schemes put forward augur well for the future of the British motor ship. The Camellaird-Fullager engine and the Doxford, Vickers and Scott-Still engines owe much to British inventive genius and capacity for working out designs to a successful issue, and other makers, availing themselves of continental help, have influenced their adopted designs in the direction of conformity to the recognized high standards of British marine practice. Whilst naturally we feel some regret that in many cases British makers are still not only employing foreign designs, but are even dependent upon foreign firms for the supply of certain parts, it is made abundantly evident by this Review organized by the North-East Coast Institution that our own shipbuilders and marine engine builders are now attacking the matter with energy, and we are inspired with the hope that before many years are past our reliance on foreign designers and builders will cease, and that Great Britain will lead in the construction of internal combustion marine engines as she has long done in steam marine engines and turbines.—*The Engineer*, 19 January, 1923.

DIESEL DRIVE FOR WARSHIPS.—A great deal has been written about the advantages offered by the Diesel engine from the naval point of view, but we have not hitherto come across any definite project for installing such machinery in the larger types of fighting ships. The fact that so far it has been fitted only in auxiliary vessels may be taken as evidence that in its present stage of development the Diesel engine is not adapted to the propulsion of large, high-speed ships. Not until the power capacity of the individual cylinder has been increased considerably beyond the present maximum will the internal-combustion motor replace steam machinery in major men-of-war. On the other hand, progress in this direction may be sufficiently rapid to make the Diesel-driven battleship a feasible proposition in the course of a few years.

In his paper read before a technical society in Scotland last week, Engineer-Lieutenant-Commander L. J. Mesurier, R. N., dipped into the future by forecasting a naval vessel equipped with Diesel engines generating 40,000 b. h. p. through four shafts. There would be four sets of 8-cylinder engines, so that each cylinder would have to realize 1,250 b. h. p. It is understood that cylinders of that power have already been built for experimental purposes, but none has been put on the market up to now. An output of 40,000 b. h. p. is equivalent to about 50,000 i. h. p., which would drive a 35,000-ton ship at approximately 23 knots. As Lieutenant-Commander Mesurier explained, a Diesel-driven warship would have increased radius of action on a given supply of fuel, ability to go to sea on short notice, and to increase rapidly from cruising to full speed. Moreover the absence of uptakes and funnels would confer advantages in disposition of armament and increased protection.—*Naval and Military Record*, 24 January, 1923.

NEW HIGH-SPEED BRUSH FOR CLEANING METALLIC SURFACES.—Where very large surfaces, as in the case of steel ships or other metal structures such as bridges, have to be cleaned of rust, dirt or paint, the cost of hand methods of cleaning is a very large item. With the object of providing more rapid and economical mechanical means of cleaning such surfaces, the Ingersoll Rand Company, Ltd., of 165, Queen Victoria St.,

London, E. C. 4, have recently brought out a high-speed, air-driven wire brush which gives promise of considerable utility. Experiments have shown that a wire brush rotating at a righ speed not only cleans metallic surfaces more effectively, but actually stands up to the work with less wear than when revolving at lower speeds. The machine in its entirety weighs only fourteen pounds, and this very desirable feature has been obtained by the provision of an aluminum casing into which steel bushes have been cast. Its overall length is about seventeen inches, and the maximum speed of 4,200 revolutions per minute is comfortably obtained when the air-supply pressure is ninety pounds per square inch. This



High-speed Wire Brush

brush has been used with highly successful results on ship work and also for the cleaning of rough iron and steel castings. The quality of the work is stated to be better than that usually effected by hand agents, and a substantial saving, both in time and in labor, has been accomplished.—*The Shipbuilder,* February, 1923.

NEW ELECTRIC FERRYBOAT "POUGHKEEPSIE."—The ferryboat *Poughkeepsie* which is now in operation between Poughkeepsie and Highland on the Hudson River, is undoubtedly the most remarkable craft afloat. She is one of the first commercial vessels to be propelled by electricity; she is the first Diesel-electric ferry to be put into operation; she is the only Diesel-electric-geared vessel in existence! she is the first to be constructed with a hullfin; and she lias been especially designed to act as an ice-breaker. Because of this unusual combination of unique features, she has attracted a great deal of interest in the shipping world. She was completed in September, 1922, but at first was not able to make her required speed. This difficulty has been overcome, however, and she was recently placed in regular service.

As originally designed, the propeller motors, which operate from 600 to 720 R. P. M., maximum, were connected directly to the propeller shaft. It was not possible, however, to obtain full speed with the 48 x 26-inch propellers then used. Messrs. Tams and King were retained as consulting engineers to correct this trouble, and at the suggestion of their Mr. A. B. Raymond, herring-bone gears, giving a three and one-fourths to one reduction, were installed between the motors and the propeller shaft, and 60 x 60-inch, semi-steel Keerfott propellers, to operate at about 220 R. P. M. were substituted for the original ones. The result of these changes was the gain of about forty-five per cent in the *Poughkeepsie's* speed, so that she now runs at about nine miles per hour. Normally both motors and both propellers are operated so as to give ample power and eliminate the drag due to the forward propeller, but either motor or either propeller can be cut out if desired.

The *Poughkeepsie's* propelling machinery consists of two 125-H. P.

Winton Diesel engines, each of which drives a 90-K. W. Westinghouse generator, which in turn furnish power to two 100-H. P. Westinghouse motors geared to the propellers. There are several reasons why this form of drive was adopted. The most important is its high fuel economy.

There is every reason to believe that the *Poughkeepsie* can develop a brake-horsepower per hour on less than a half a pound of oil, whereas she would certainly require over a pound of oil to develop the same amount of power if she had the most efficient form of steam engine. In addition, she has no standby losses whatsoever. Consequently, when sufficient data is accumulated it is fully expected that the daily fuel cost of the *Poughkeepsie* will prove to be about one-third of that required by a steam-operated vessel of similar power and hull size.

Another advantage is the compactness of the machinery. It can all be contained within the hull without a superstructure, leaving the main deck perfectly clear and providing room for four lines of automobiles in addition to the passenger cabins on either side. The *Poughkeepsie's* car capacity is therefore practically double what it would be with steam propulsion.

Finally, the pilot has absolute control over the movements of the vessel. By merely moving a small handle located behind the wheel in each pilot house, he can start, stop, reverse or change the speed of the boat without the loss of an instant's time or the slightest opportunity of having his signals misunderstood. So agile is this control that the *Poughkeepsie* can be brought from full speed ahead to full speed astern in less than a minute.

To look at the *Poughkeepsie,* she appears to be broad, shoal, and of very light draught. This is not the case, however, for under her visible hull is a second one, known as the "hullfin," which is a long and narrow stream-line projection, like an enlarged keel. It contains the propeller motors, gears and shafting, and carries the propellers at its ends. Its chief purpose is to place the propellers under the boat, where they are always immersed in solid water. It also enables the *Poughkeepsie* to act as an ice breaker. Instead of wedging into the ice, as a boat with a standard hull will do, the broad end of the *Poughkeepsie* rides over it, crushes it, and then pushes it aside. The position of the propellers on the hullfin prevents them from being injured during the process. No very heavy ice has been encountered in the river so far this winter, but it is expected that the *Poughkeepsie* can keep in operation with even the maximum thickness of ice, which sometimes exceeds two feet at this point.—*Nautical Gazette,* 10 February, 1923.

BARGE SEPARATING OIL FROM BALLAST WATER.—The Oil in Navigable Waters Act, 1922, which came into force on January 1, has been responsible for the production of a separator barge, designed from the experience gained as the result of experiments carried out at Smith's Dock Company on the separation of scum from ballast water. The barge has been produced in conjunction with the Anglo-Saxon Petroleum Company, in order to obviate the necessity for a vessel having to proceed beyond the three-mile limit to discharge ballast water. The principle of operation is that of the surface separation of liquids of different specific gravities, the liquid having the lighter specific gravity rising to the surface. The barge is divided into a number of compartments by transverse bulkheads, the first being a receiving compartment. From this the liquid passes into another compartment, provided with a series of cones and baffles, while the bulkheads between the remaining compartments are arranged to form cascade filters. From the receiving compartmnt the oily water enters the cone filtering compartment, where practically all

the scum is trapped by means of an intensive system of cascading and baffling, consisting of a number of superimposed cones terminating in the form of a bottle neck. The function of this is to reduce the free area of the scum which rises to the surface. When this accumulates in sufficient quantities in the bottle neck, it overflows into the scum trays surrounding the filter cone top and drains from there into the scum storage tank. The remainder of the ballast water passes on through the cascade filter compartments, which are made up of a number of transverse bulkheads extending from side to side of the barge, each having a horizontal slot at the top, and bottom alternately, the slots running the full breadth of the bulkheads. The compartments are partially closed at the top, by a sloping plate, which consists the free surface as much as possible, so that the scum which may rise to the top is accumulated on a relatively small area instead of on a large one. By this arrangement the thickness of the scum floating on the surface of the water is increased and rendered more removable. The barge is fitted with a Hayward-Tyler pump, which can draw from the river, from the filter compartments, or from the scum storage tanks, and deliver to a deck connection, from which there are two branches, one leading to the filter compartment and the other delivering ashore. It is found that the scum does not seriously extend beyond the fourth cascade opening, and can then be dealt with by hand. Heating coils, fitted in the storage tank, allow the scum being heated and settled. The separated water is pumped from the bottom of the tank through the cone filter until practically nothing but pure oil remains. This can either be delivered back to the ship or ashore, as desired. Some successful trials were carried out with the oil tanker *Corbis* recently, and many authorities expressed themselves satisfied with the barge's performance.—*Marine Engineer and Naval Architect,* February, 1923.

AERONAUTICS

ARMY PLANE WITH EIGHT GUNS.—An airplane equipped with eight machine guns and capable of firing approximately 5,000 rounds, was tested at Kelly Field yesterday. The plane is the first that has ever been equipped with so many machine guns, officers said. Previous experiments have been made with four guns. The results of the test were highly satisfactory.—*Boston Evening Transcript,* 6 February, 1923.

DISPERSAL OF CLOUDS AND FOG.—Rainfall has been caused and clouds have been made to disappear in a series of experiments which are being conducted here at McCook Field, according to announcement made today by the experimenters, Professor Wilder D. Bancroft, of Cornell University, and L. Francis Warren. The successful experiments were made with the co-operation of the army air service.

In brief, the clouds were made to disappear and precipitate their moisture by the dropping of electrically charged grains of sand upon them from airplanes.

Professor Bancroft and Mr. Warren claim that the process will be of great value in the commercial world, as fogs over cities, harbors and flying fields can be made to disappear, thereby insuring safety to travel and transportation. They do not claim that in every instance rain or precipitation can be produced, as they say all clouds do not contain sufficient moisture.—*Baltimore Sun,* 12 February, 1923.

ENGLAND'S WONDER AIRCRAFT.—In the light of certain very remarkable developments which have recently taken place in aircraft construction, the whole of the Government's air policy is, it is learned from an authoritative source, being reviewed, and experts are already engaged in

the drafting of the new policy, which is to be submitted to the Cabinet at an early date, so that the increased expenditure may be included and covered in the Budget which is to be presented to the House of Commons in the spring.

It is already certain that there will be a very considerable increase in the number of machines to be constructed in the coming financial year.

The far-reaching character of these epoch-making developments was unfolded yesterday to a Press representative by one of the foremost authorities in the aircraft industry. He said:

"The new type of machines which, during the past two years, has been experimented with under conditions of the greatest secrecy has more than demonstrated the immense possibilities of the future. If, unhappily, in the near future, war should come, the enemy will find Britain prepared and possessing wonder machines the like of which have never been dreamed of in the realms of cold fact. We are, indeed, at the moment ahead of all other nations."

One of the main objects of the designers has been to give the machines an increased climbing power. Experiments have shown that with the old type of machine known in the service, adjustments can be made which increase the climbing power from 20,000 to even 40,000 ft. All the new machines are being made with increased climbing power.

Another important development is in the direction of producing the silent aeroplane. The Air Ministry already possesses engines which are to all intents and purposes silent, and experiments which have already been carried out recently at Farnborough have proved the feasibility of producing a silent propeller, so that in the very near future the actual silent aeroplane for bombing work is more than a possibility.

Torpedo-carrying aeroplanes are being developed for work at sea, and the Air Ministry have in commission a large number of these planes which can carry large-type torpedoes. In the main the torpedo-carrying aeroplanes are to be housed in the newly-commissioned floating aerodromes. These machines can rise almost vertically from the deck of a warship, swoop down on their prey, discharging torpedoes at short range, and return to the floating aerodrome, alighting on the deck slowly without any danger to the widespread wings.

The planes possess a speed of upwards of 140 miles an hour in the air, and can swoop down to the deck of the parent ship, reducing their speed on the downward glide.

Great strides have been made in perfecting the fighting machine, and the aeroplane of the future is likely to be constructed from special-hardened steel in the place of wood.

The two all-metal machines which came from Germany to this country recently, and were described as being the very last word in aircraft, were, it is definitely stated, behind in many highly-important details the all-steel machines which we own. Troop-carrying planes, capable of transporting twenty-five to thirty men, by which a small army of men, well equipped, could be suddenly landed at any desired spot, are also being built. The plane carrying 1,000 men or more is yet a dream of the future. "Hush, hush," has been the policy of the Air Ministry, throughout the experimental stages.—*Naval and Military Record*, 24 January, 1923.

ANTI-AIRCRAFT GUNS BRING DOWN TARGETS.—Galveston, Tex., February 20—The anti-aircraft problem the Sixtieth Anti-Aircraft Battalion worked out over Fort Crockett last night was described by Major General Edward M. Lewis, commander of the Eight Corps Area, as among the best he had seen.

Amid the glare of six searchlights, five throwing beams of three billion candlepower, and one smaller, four kites were towed high in the night air, across the line of fire, and demolished, one after another, by two sections of machine guns, each containing three guns.

Two kites were cut loose from their strings, and floated to the ground amid a hail of bullets, while the other two were so badly hit that they could not fly. Tracer bullets, the paths of which could be plainly descerned by all spectators, were used in the firing.

After the demolishing of the kites fourteen tiny hydrogen balloons were released from unknown positions about the field. As fast as each balloon was picked up by the rays of the searchlight, it was peppered with shots. Two of the balloons were demolished at the first shot, an unusual feat of marksmanship, according to General Lewis.—*Boston Evening Transcript,* 20 February, 1923.

ORDNANCE

DESTROYERS TO USE DIRECTORSCOPE.—With the coming southern maneuvers, the directorscope for destroyer firing will be used for the first time in action in the U. S. Navy. The eleventh and twelfth destroyer squadrons have been drilling with the new device for the past two months and are now ready to take it into action. The directorscope enables destroyers to fire salvos from all guns which can be brought to bear upon a given target.—*The Naval Monthly.*—February, 1923.

MORE RANGE WITH NEW BULLET.—Work of Army experts since the war has produced a new bullet for use in rifles and machine guns which is expected to add enormously to the effectiveness of these weapons in any future conflicts. The new bullet is known as a "boat-tail" because of a six-degree taper at the tail. Exhaustive tests have shown that the change in shape has added 1,400 yards to the maximum range and flattened the trajectory or arc of flight at 1,000 yards approximately thirty per cent. The Army experts have worked out a new jacket for the bullet that virtually eliminates fouling the gun barrels. It is a ninety per cent copper and ten per cent zinc composition that leaves the rifling clear of clogging metal and will increase the accuracy life of rifles and machine guns. It also will permit accuracy with small arms to be as great in combat as in peace time target work.

Tests at the arms infantry school have fixed the maximum range of the new bullet at 4,800 yards as compared to 3,450 yards with the present ammunition. It also has been demonstrated that at 600 yards with the new ammunition it is possible to put every shot into a circle the size of a teacup as the "boat tail" is less subject to wind current deflection.—*Boston Evening Transcript,* 29 January, 1923.

RANGE OF GERMAN SUPER-GUN PUT AT 132,000 YARDS.—Army statistics credit the German super-gun that pounded Paris during the war with a range of 132,000 yards, as compared to the 30,000 yard maximum range of the American 14-inch naval guns. The German projectile for which figures are given, however, was 8.26 inches in diameter and weighed only 264 pounds, as compared with the 1,400-pound, 14-inch monster used in the American gun.

The report describes the German gun as constructed "from wornout 15-inch, 45-caliber naval guns, mounted on concrete emplacements."

"The converted guns," it adds, "were of two parts; the main section was 98.5 feet long, and the forward section 19.7 feet. The 15-inch gun was bored out and a heavy, uniformly rifled tube 8.26 inches in diameter inserted, 42.3 feet of this tube projecting beyond the muzzle of the gun. Over this projecting portion a hoop was shrunk.

"The muzzle section, 83.6 feet in length, was screwed to the end of this hoop tube. This forward tube was unrifled and was probably added to impart additional lineal velocity and better align the axis of the projectile with that of the bore of the gun."

The super guns could be rebored twice, first for 9.3-inch projectiles, and again for 9.93-inch missiles. One of the guns which fired on Paris, seven of which had been constructed in all, had been thus rebored, the report said.

Compared with the American 14-inch naval gun, the German superweapon was 118.2 feet in length against 59.7 feet; developed 467,250 foot-tons muzzle energy against 85,750; weighed 318,000 pounds, against 180,395; had a muzzle velocity of 4,760 feet per second, against 2,800; maximum elevation of fifty-five degrees, as against 38 degrees, and had an accuracy life of fifty rounds, as compared to 250 rounds for the American gun.—*Washington Post*, 15 February, 1923.

NAVIGATION AND RADIO

TO SURVEY CUBAN GULF.—The *Hannibal*, with several auxiliary craft, has sailed for Cuban waters to continue surveying the Gulf of Batabano and the Isle of Pines, the Hydrographic Office announced tonight.

The *Hannibal* had installed before sailing a sonic depth finder such as are used in studying the bottom of the Pacific Ocean to determine the cause and effect of earthquakes.

In addition to the *Hannibal*, the expedition consists of two sub-chasers, one seaplane, two specially fitted 500-ton steel barges with living quarters and five forty-foot sounding boats.

The personnel of the *Hannibal* has been increased by 105 officers, hydrographic surveyors, draughtsmen and enlisted men.

Survey of this area is important to the navy on account of the naval base at Guantanamo.—*New York World*, 29 January, 1923.

PREVENTION OF STATIC.—Prevention of static interference in the reception of radio signals has been solved, it is stated, by an invention of Dr. B. Galen McCaa, of Ephrata, near Lancaster, Pa., U. S. A. Two different systems have been developed, and in California this summer a static of 6,000 audibility was reduced to five, at which time commercial signals were received at 250 times the strength of the static. The second system has produced results superior to those obtained in California. Tests have been made with the latest scheme at 360 m., on which a broadcasting system is operated, and it is known that the device will operate on all radio systems at any wave lengths. The latest device is free from critical adjustments, and is absolutely stable in operation, requiring no attention. The fact that it operates on an aerial makes it applicable for use on ships at sea, and becomes another important factor in life-saving by assuring absolute communication between vessels in conditions in which they cannot now operate.

A series of experiments in Transatlantic radio telegraphy was recently completed in South London by members of the Radio Society of Great Britain, the organization formerly known as the Wireless Society of London. The object of the experiments was to show the practicability of communication between this country and America on a far shorter wave length and much lower power, and with a much smaller, less complicated and expensive aerial than are used by the official and commercial stations. The experiments were made on ten successive days, from December 22, with apparatus installed at the base of the chimney on the premises of the County of London Electric Supply Company at Wandsworth. The aerial consisted of six wires on a hoop 5ft.

in diameter, fitted to the chimney, 170 ft. high. The maximum wave length used throughout the ten days was 200 m., and the maximum power 1.5 kilowatts. The call number of the station was 5 W. S. These successful experiments were a unique achievement for British amateurs. Official and commercial stations, when communicating with America and other distant countries, use wave lengths of from 15,000 m. to 30,000 m., and power from 250 to 350 kilowatts. The tests impressed the authorities, who had been inclined to doubt their usefulness ever since the society first contemplated making them, nearly a year ago.—*The Engineer*, 19 January, 1923.

MISCELLANEOUS

ITALY RATIFIES THE TREATIES.—With only scattered votes of disapproval, the Italian Chamber has ratified the treaties negotiated last year at the Washington Conference. The treaties approved include the agreements for the limitation of naval armament, for the restriction of the use of submarines and noxious gases in warfare and for the settlement of certain Far Eastern questions. The action of the Italian Chamber leaves France as the only one of the signatories to the treaty for the limitation of naval armament that so far has not ratified last year's agreement. Advices from Paris indicate that the French Parliament will ratify the treaty in the near future, and the approval of the Italian Chamber was no doubt given with the tacit assumption that ratification by the French Chamber would soon follow.—*Boston Evening Transcript*, 10 February, 1923.

FRANCE TO RATIFY NEXT.—Paris, February 8—The treaty for the limitation of naval armament signed at the Washington Conference will be presented shortly to the French Parliament with a recommendation for ratification, but with the understanding that the limitations on French armament should not be accepted as establishing a principle. A report to this effect has been nearly completed by Charles Guernier, who was recently empowered by the foreign affairs commission of the Chamber of Deputies to put the commission's ideas in draft form.

The Chamber will be asked to adopt a resolution to the effect that, inasmuch as the Root resolution prohibits submarines from attacking merchantmen, the latter class of vessels should be defined and should be forbidden from arming. A member of the commission explained that France was willing to ratify the treaty because she would be unable for financial reasons to exceed its limitations during the life of the treaty, at any rate.

Some expression against the establishment of the principle of naval limitation is regarded as necessary, as it is considered certain France would not subscribe to the same restrictions after the expiration of the accord in 1936.

The report, which was drafted after thorough discussion in the commission, is believed to represent the sentiments not only of the commission but of the Government. It includes a reservation similar to that adopted by the American Senate, designed to leave France free from obligations to any armed co-operation. The reservation reads:

"The attached texts do not obligate France to any armed co-operation. They do not imply any alliance nor any obligation to participate in defensive action."

The report in presenting this reservation, and referring to the American Senate's action, says:

"The French Government in its turn accepts the view that, in case of difficulties, the treaty contemplates only friendly conversation, and does not imply obligation to intervene by arms in case of conflict."

The report reviews the history of the Washington accord, sets forth its objects and the reasons for its existence, and comments that the tripartite accord was enlarged to include four signatories only after France had presented arguments to show that she was a great Pacific Power and entitled to participate.

The accord applies only to the islands in the Pacific, the report remarks, "and if France were attacked in her continental possessions she would not even have resort to the conversations that ought to precede, and possibly avoid, a rupture."

"France, in such an instance," it continues, "would be aided in her relations with Japan by the treaty concluded with that Power on June 10, 1907, which constitutes a guaranty whose value cannot be disputed."

The advantages of the Pacific accord, the report says, are "all purely moral for all the interested Powers."—*Boston Evening Transcript*, 8 February, 1923.

FRANCO-ITALO ALLIANCE?—Paris, February 14—France is making a military and naval alliance with Italy. This fact was disclosed to me by Pierre Depuy, president of the marine commission of the Chamber of Deputies. He also stated that the attitude of the Italian Chamber might now be exerted favorably upon the French Parliament for the acceptance of the Washington naval agreements, but not without reservations.

"The military and naval alliance now under discussion between France and Italy removes some of the technical difficulties which prevented heretofore the ratifying of the Washington conventions," he said. "From now on the navies of France and Italy will co-operate in the Mediterranean.

"The Washington agreement is not to be settled immediately. There must be considerable parliamentary routine before a vote will be possible. Three or four months must elapse. Also France still is willing to let matters drag a while owing to the confused European political situation. The world's future still is in the melting pot.

"The policy of our Italian alliance will be one of the determining factors of our final acceptance, even though such an alliance does not mean we bind our fate to that of any country or group of Powers.

"The Washington agreement does not appear urgent to the French people. The Ruhr problem and the Near East are taking our entire attention. Thus we may yet have still another opinion of the Washington treaty and the Root reservations.

"We certainly will ratify without discussion the clauses obliging submarines not to attack merchantmen, even though we consider this paragraph of little practical value. In the next war our traders will be armed before leaving port, and, therefore, submarines need not consider them unarmed ships. The Root reservations limiting the building of submarines we do not accept because we consider the submarine our best defense and the only means of keeping in touch with our colonial empire in Africa. The decrease in the birth rate of France forces us to rely on colored recruits, therefore we need submarines to escort troops and transports.

"Regarding the treaty itself, we acknowledge that France has not enough money to build more ships than she was allotted at Washington. We have no aggressive aims, but if we enter such an alliance with the United States and Great Britain they must consider us a partner having equal benefits and responsibilities."—Wyeth Williams in *Boston Evening Transcript*, 14 February, 1923.

NEW CODES FOR WAR USE OF RADIO AND AIRCRAFT.—The Hague, February 20—The conference of jurists appointed under the resolutions of the Washington armament conference to study the laws of war, ended its sessions yesterday. Their report contains two proposals regarding wireless telegraphy and the use of aircraft in time of war. The report will be presented to the governments concerned and they will decide whether it shall eventually be published.

This conference was held under a resolution adopted by the Washington Conference which provided that the first step toward revision of warfare regulations should be taken up by a "commission," presumably composed of international law experts, without plenipotentiary powers, but the resolution provides that after they have agreed the five Governments shall "confer as to the acceptance of the report and the course to be followed to secure the consideration of its recommendations by civilized Powers."

It was taken for granted at Washington that questions of national policy as well as legal considerations would enter into the final decisions reached and that the whole problem of the submarine, one of the storm centers of the Washington Conference, would be reopened.

In leaving determination of new rules of warfare to a later conference, the Washington Conference carried out the recommendations of a subcommittee of experts who spent several weeks considering the subject.

The resolution of the conference providing for this conference said:

The United States of America, the British Empire, France, Italy and Japan have agreed:

1.—That a commission composed of not more than two members representing each of the above-mentioned Powers shall be constituted to consider the following questions:

(a) Do existing rules of international law adequately cover new methods of attack or defense resulting from the introduction or development, since The Hague Conference in 1907, of new agencies of warfare?

(b) If not, what changes in the existing rules ought to be adopted in consequence thereof as a part of the law of nations?

2.—That notices of the appointment of the members of the commission shall be transmitted to the Government of the United States of America within three months after the adjournment of the present conference, which after consultation with the Powers concerned will fix the day and place for the meeting of the commission.

3.—That the commission shall be at liberty to request assistance and advice from experts in international law and in land, naval and aerial warfare.

4.—That the commission shall report its conclusions to each of the Powers represented in its membership.

Those Powers shall thereupon confer as to the acceptance of the report and the course to be followed to secure the consideration of its recommendations by the other civilized Powers.

The committee also adopted a resolution which is in effect a part of the resolution.

Resolved, That it is not the intention of the Powers, agreeing to the appointment of a commission to consider and report upon the rules of international law respecting new agencies of warfare, that the commission shall review or report upon the rule or declarations relating to submarines or the use of noxious gases and chemicals already adopted by the Powers in this conference.

It will be noted that this resolution did not itself mention poison gas, submarines, aircraft or wireless, but discussion, other resolutions and negotiations at Washington did. The Committee on Limitation of Armament voted unanimously that:

The committee is of the opinion that it is not at present practicable to impose any effective limitations upon the numbers or characteristics of aircraft, either commercial or military.

The committee is of the opinion that the use of aircraft in war should be covered by the rules of warfare as adopted to aircraft by a further conference which should be held at a later date.—*Boston Evening Transcript*, 20 February, 1923.

BRASSEY'S NAVAL AND SHIPPING ANNUAL.—From year to year *Brassey's Naval and Shipping Annual* appears to increase in bulk and value. It has now reached its thirty-fourth year of publication, and the volume just published is the third in its improved and enlarged form. In every respect it reflects the highest credit upon the joint editors (Sir Alexander Richardson, M.P., and Mr. Archibald Hurd), upon the art editor (Mr. A. J. W. Burgess), and the publishers (William Clowes and Sons, Limited).

In addition to silhouettes, there are numerous illustrations and plans of British and foreign warships, the illustrations including designs for "Washington Conference" capital ships and light cruisers, and also a design for an experimental battleship. The chapter devoted to comparative naval strengths, with tables of battleships, battlecruisers, and light cruisers of the five great naval Powers, is also a feature which will be much appreciated.

Commander C. N. Robinson again deals with the progress of the British Navy, and Mr. John Leyland with that of foreign navies, and both articles are so full of useful facts that they should be studied by all who are desirous of taking an intelligent interest in the changes in and developments of the navies of the Great Powers.

Washington and After

Of the general articles, one of the most important is that by Admiral of the Fleet Sir Doveton Sturdee on "Naval Aspects of the Washington Conference." Admiral Sturdee has written a comprehensive and discriminating review of the situation of 1921 and at the present time; and he leaves no doubt that the recent decision of the Government "to construct under the terms of the treaty two capital ships of 35,000 tons to carry guns of not greater caliber than 16-in." has his unqualified support.

"In order to maintain a 'one-Power standard' in capital ships," Admiral Sturdee declares, "their construction is essential. At the present moment the United States possesses three post-Jutland capital ships carrying 16-in. guns, and Japan two, while Great Britain has only the *Hood*, a ship commenced before the battle of Jutland, which only carries guns of 15-in. caliber, besides not embodying the valuable experience obtained on that occasion. Thus Great Britain has no capital ship carrying 16-in. guns, and has only one recent ship to take her place in the line of battle to three possessed by the United States and two by Japan.

"One of the most important revelations during the war was the great superiority of a ship with large caliber guns over a ship with guns of less caliber. This, with the increasing range at which future naval actions will commence, renders it all the more desirable that these two new ships should be constructed. It is most noteworthy that in the opinion of the senior officers of the maritime nations in command of fleets in the recent war, the capital ship still remains the bed rock on which all naval strength must be based. As the Grand Fleet controlled the movement of the High Sea Fleet in the recent war, so the battle fleet in the near future will render subsidiary movements either possible or impossible."

Experimental Battleships

It is appropriate that the subject of the next article in the volume should be "The Influence of the Washington Conference on Naval Design." This is contributed by Sir George Thurston, and three of the drawings mentioned above illustrate portions of the text.

"It may be of interest," the writer remarks, "to consider a special type of battleship designed as an experiment to comply with the conditions laid down at the Washington Conference, seeing that the exceedingly small number of capital ships to be constructed during the next ten years cannot appreciably affect the relative positions of the contracting Powers.

"The type in question with a speed exceeding 30 knots would be provided with a maximum of vertical and horizontal armored protection, including the fullest underwater protection. The main armament would consist of three 16-in. guns triple-mounted in a barbette forward. The auxiliary armament would consist of, say, 6 twin-mounted 7½ in. or 8-in. guns, together with a certain number of 4.7-in., or 6-in. anti-aircraft guns on dissappearing mounts.

"The vessel would, so far as the arrangement of armament allowed, be fitted as a carrier for aircraft, such craft being purely for the purpose of her own defense and action. This solitary and powerful unit could, if required, take her place in the fighting line as part of a battle fleet, or, in emergency, be dispatched for foreign stations, possessing high speed and fully equipped as regards armament and protection. Dispensing with the usual protection afforded by accompanying craft and aeroplanes, she would carry within her the planes necessary for scouting, or torpedo and bomb dropping, and her upper or super-structure deck would be constructed without obstacles for the launching and return of her aircraft. To effect this her general appearance and arrangement as a capital ship would be materially altered, the funnels and deck casings would entirely disappear, and the smoke and other products of combustion be conducted overboard through ducts swept by the water from the circulating pumps and other sources."

A varied and most interesting series of articles follow, the list of contributors including Capitaine A. Delpierre, late of the French Navy; Rear Admiral W. H. D'Oyley, Commander C. Dennis Burney, R. N. M. P.; Mr. Archibald Colbeck, Commander H. Rundle, R. N.; and Commander C. N. Robinson. An article by Sir. Eustace H. T. d'Eyncourt on "The Royal Corps of Naval Constructors" has been dealt with in a previous issue of *The Naval and Military Record.*

Mercantile Marine

Among the contributors to the merchant shipping section of *The Annual* are Sir Westcott Abell (chief ship surveyor, Lloyd's Registry of Shipping), Mr. R. W. Richardson, Sir Lord Inchcape, Mr. James Richardson, Sir Frederick Lewis, Sir A. G. Anderson, M. J. Anderson, Mr. F. A. Hook, Capt. Harry Davis, Mr. Sanford D. Cole, and Mr. G. A. Vallance. These writers are all experts in the subjects which they have chosen to discuss, and their views may be read with interest and profit by all connected with the mercantile marine.—*Naval and Military Record*, 24 January, 1923.

THE NICARAGUA CANAL.—Estimates by army engineers that the cost of constructing a new isthmian canal through Nicaragua would be nearly $1,000,000,000, led to an announcement by President Harding today that the project had been abandoned for the present.

The President had hoped, it was said, that it might be possible to build a Nicaraguan canal out of the earnings of the Panama Canal

which has been doing an unprecedented business for six months. The pre-war price of building the Nicaraguan canal, with dimensions similar to those of the waterway at Panama, would have been $494,000,000, according to an estimate given to Secretary Weeks by Major General Lansing H. Beach, Chief of Engineers of the Army. Present-day costs, however, would more than double this figure.

A statement issued by Secretary Weeks today, including the report of the army engineers, said the commission named by Roosevelt in 1901 estimated the cost of a canal via the Nicaragua route, thirty-five feet deep with 450 feet minimum bottom width and eight locks, four on each side of the Nicaragua lake, each with two chambers eighty-four feet by 740 feet clear dimensions, at $189,864,062.

The protocol just signed with Costa Rica by the United States Government, it was explained today by a high Administration official, does not mean that any rights have been conceded to that country which have not been recognized by this Government right along. The protocol, it was stated, consists principally of an engagement to negotiate with Costa Rica to take care of any Costa Rican rights that might be involved in the construction of a Nacaraguan canal by the United States, so that there will be no violation of Costa Rican sovereignty. The agreement is in no sense a treaty, it was explained, but merely an engagement to discuss the subject under consideration and does not in itself constitute a full agreement upon that subject.—*New York Times*, 10 February, 1923.

PANAMA CANAL TOLLS.—A cablegram has been received from Colonel Morrow, Governor of the Panama Canal, that the receipts for tolls for commercial vessels transiting the Canal during January, as well as the number of vessels, breaks all previous records, the total number of commercial ships being 352 and the receipts from tolls $1,505,285.55, as compared with the monthly average for the previous six months ending December 31, 1922, of 273 ships and $1,167,007.23 for tolls.

The following statement shows receipts from tolls on commercial vessels transiting the Panama Canal during the past seven months in comparison with receipts for the same seven months of the fiscal year 1922; also monthly averages for fiscal years 1919-22, inclusive:

Month	*Number of Commercial Vessels*		*Tolls Collected*	
	1922-3	1921-2	1922-3	1921-2
July	251	206	$1,094,127.42	$ 804,503.11
August	257	236	1,055,336.75	955,380.78
September	240	221	1,020,064.55	892,001.54
October	294	255	1,255,508.00	1,047,935.62
November	294	222	1,264,436.54	923,048.70
December	304	239	1,312,570.12	1,003,598.27
January	362	210	1,505,285.55	847,767.55
TOTAL 7 mos.	1,992	1,589	$8,507,328.93	$6,474,235.57
Average, 7 mos.	284	227	$1,215,332.70	924,890.80

FEDERAL REORGANIZATION PLAN TO AWAIT STUDY.—Proposals for the sweeping reorganization of the Federal Government, in accord with the Administration plan just submitted to the joint Congressional Committee, will require exhaustive study before there will be any consideration of action by Congress.

The joint Committee engaged in preliminary discussion today with the chairman, Walter F. Brown, and adjourned to meet next week, when the

question of hearings will be decided and the procedure of the committee determined.

No Action This Session

There is no thought of action in this session of Congress. Whether the joint committee will work through the Congressional vacation period and hold hearings in that time is to be settled.

The first desire of the Administration is to arrange suitable publicity to bring favorably before the country the program involving so extensive a modification of the executive departments, including the consolidation of the War and Navy Departments into one department of defense, creation of a new Department of Education and Welfare and change of the name of the Postoffice Department to Department of Communications.

Program in Detail.

In the meantime here is a picture of the executive branch of the Government as it would be under the Administration's program:

The President, secretary and staff.

1. Department of State

Secretary of State, diplomatic service, consular service, United States sections international commissions.

(*a*) Under Secretary of State, office of economic adviser, divisions of Latin-American affairs, Mexican affairs, current information, publications and office of special agent.

(*b*) Assistant Secretary, divisions of Western European affairs, Near Eastern affairs, Eastern European affairs and bureau of appointments.

(*c*) Assistant Secretary, division of passport control, visa office, diplomatic bureau and bureau of indexes and archives.

(*d*) Assistant Secretary, office of ceremonials, division of Far Eastern affairs, bureau of accounts and war trade board section.

(*e*) Assistant Secretary, bureau of insular affairs, consular bureau, office of consular personnel, commercial office, division of political and economic information and office of chief clerk.

(*f*) Solicitor.

2. Department of the Treasury

Secretary of the Treasury.

(*a*) Under-Secretary, in charge of fiscal bureaus: Commissioner of the Public Debt, division of loans and currency; Register of the Treasury, division of public debt accounts and audit, savings division; Commissioner of Accounts and Deposits, divisions of bookkeeping and warrants and deposits; Treasurer of the United States, Comptroller of the Currency, bureau of mint, Federal farm loan bureau, secret service division.

(*b*) Assistant Secretary, in charge of foreign loans and miscellaneous: Bureau of engraving and printing, general accounting office, departmental executive offices, Solicitor of the Treasury.

(*c*) Assistant Secretary, in charge of collection of revenues: Bureau of internal revenue, solicitor of internal revenue, prohibition commissioner; division of customs, customs service.

3. Department of Defense

Secretary for Defense:

(*a*) Under-Secretary for the army, assistant secretary; executive offices: General staff, war boards and commissions, offices of adjutant-general, inspector-general, judge-advocate-general, quartermaster-general, chief of finance, surgeon-general, chief of ordnance, chief of chemical warfare service; militia bureau, chief of chaplains, chief signal officer, chief of

air service, chief of infantry, chief of cavalry, chief of field artillery, chief of coast artillery, chief of engineers, Military Academy, Panama Canal.

(*b*) Under-Secretary for the navy, assistant secretary; executive offices: Office of naval operations, navy boards, bureau of navigation, Naval Academy, bureaus of yards and docks, ordnance, construction and repair, engineering, aeronautics, supplies and accounts, medicine and surgery, revenue cutter service, headquarters Marine Corps, judge-advocate-general, solicitor.

(*c*) Under-Secretary for national resources, assistant secretary; executive offices: For men, munitions, food and clothing, transportation, communications, fuel, miscellaneous.

(*d*) Joint board.

(*e*) National advisory committee for aeronautics.

4. Department of the Interior

Secretary of the Interior, Executive offices:

(*a*) Assistant Secretary for public domain, Alaska and Hawaii, Indian lands and reservations, general land office, geological survey, war minerals relief commission, national park service, national military park commissions, Federal power section.

(*b*) Assistant Secretary for public works, bureau of public roads, supervising architect's office, Alaskan engineering commission, reclamation service, board of engineers for rivers and harbors, including board of engineers for New York city, United States Engineer offices, Mississippi river commission and California debris commission; board of road commissioners for Alaska, bureau of District of Columbia buildings and grounds.

(*c*) Solicitor.

5. Department of Justice

Attorney-General; Solicitor-General.

(*a*) War contracts section.

(*b*) Bureau of Investigation.

(*c*) Office of Pardons.

(*d*) Assistant to the Attorney-General over anti-trust division.

(*e*) Assistant Attorney-General over division for defense of suits.

(*f*) Assistant Attorney-General over public lands division, including office of titles and office of land litigation in District of Columbia.

(*g*) Assistant Attorney-General over criminal division.

(*h*) Assistant Attorney-General over division of admiralty, finance, foreign relations, territorial and insular affairs, and over alien property custodian.

(*i*) Assistant Attorney-General over division of taxation, insurance, prohibition and minor regulations of commerce.

(*j*) Assistant Attorney-General over customs division.

(*k*) Assistant Attorney-General over executive offices.

6. Department of Communications (Postoffice)

Secretary of Communications, under-secretary of communications, executive offices.

(*a*) Assistant Secretary for postal service, postmasters' appointments division, postoffice service division, dead letter division.

(*b*) Assistant Secretary for postal transportation, railway mail service, railway adjustments, foreign mails, air mail service.

(*c*) Assistant Secretary for postal finance, office of comptroller, money orders, postal savings, registered mails, stamp division, finance division, classification division.

(*d*) Assistant Secretary for postal purchases and supplies, rural mails, motor vehicle service, equipment and supplies.

(*e*) Assistant Secretary for telephone and telegraph (including radio), with separate telephone and telegraph divisions.

(*f*) Chief Inspector.

(*g*) Solicitor.

7. Department of Agriculture

Secretary of Agriculture, Assistant Secretary, executive offices and following subdivisions: Administration of packers and stockyards and trading in grain futures, weather bureau, bureau of animal industry, bureau of plant industry, botanic garden, forest service, bureau of chemistry, bureau of soils, bureau of entomology, bureau of biological survey, division of publications, States' relations service, bureau of agricultural economies, insecticide and fungicide board, Federal horticultural board, solicitor.

8. Department of Commerce

Secretary of Commerce, executive offices:

(*a*) Assistant Secretary for Industry, bureaus of standards, mines, fisheries and Federal statistics, including census, customs statistics, mineral production statistics and internal commerce statistics; bureau of patents.

(*b*) Assistant Secretary for Trade, bureau of foreign and domestic commerce, United States section inter-American high commission, bureau of transportation, including airways, waterways (all Federal canals except Panama) and highways.

(*c*) Assistant Secretary for Merchant Marine, coast and geodetic survey, including lake survey and hydrographic office; national observatory, bureau of lighthouses, life-saving service, bureau of navigation, steamboat inspection, inland and coastwise waterways service, supervisor of New York harbor.

(*d*) Solicitor.

9. Department of Labor

Secretary of Labor, assistant secretary, second assistant secretary, executive offices; bureaus of immigration, naturalization, labor statistics, women's bureau, children's bureau, division of conciliation, employment service, housing corporation, solicitor.

10. Department of Education and Welfare

Secretary of Education and Welfare, executive offices.

(*a*) Assistant secretary for education, general education, including bureau of education, Indian schools, Howard University, Columbia Institution for the Deaf, Smithsonian Institution; physical education, vocational education and section for vocational rehabilitation.

(*b*) Assistant secretary for public health service, quarantine and sanitation, hospitalization, national home for disabled volunteer soldiers, soldiers' home, St. Elizabeth's Hospital, Freedmen's Hospital, research.

(*c*) Assistant secretary for social service, women's bureau, children's bureau, superintendent of prisons.

(*d*) Assistant secretary for veteran relief, veterans' bureau, bureau of pensions.

(*e*) Solicitor.—*Baltimore Sun*, 17 February, 1923.

CURRENT NOTES AND PROFESSIONAL PAPERS

"A Review of Different Types of Marine Internal-combustion Engines —Part I."—(A collection of papers read in Newcastle before the North-East Coast Institution of Engineers and Shipbuilders, on 12 January, 1923).—*The Marine Engineer and Naval Architect*, February, 1923.

"Twenty Years of Diesel Engine Building."—(A review of progress made up to and including a proposed 40,000-B. H. P. Naval Vessel.)—By Engineer Lieutenant Commander L. J. Mesurier in *The Engineer*, 26 January, 1923.

"The Muscle Shoals Nitrate Plant."—(Showing relation of this plant to the Nitrogen supply, and discussion of the three processes for the fixation of Nitrogen.)—By John K. Clement in *Army Ordnance* for February, 1923.

"The World Race for Oil."—(Extracts from local and foreign press articles on the control of the oil supply of the world.)—*The Literary Digest*, 20 January, 1923.

"Japan: A Sequel to the Washington Conference."—(To be published in full in May issue of the NAVAL INSTITUTE PROCEEDINGS.)—By Hector C. Bywater in the *Atlantic Monthly*, February, 1923.

"The Relation of Politics to War."—(A discussion of the Eastern Question from the point of view of the relation of policy and strategy and comparing England's lack of doctrine with regard to the Eastern Question as compared to their excellent doctrine from the very start of the World War.)—By Sir Edward M. Grigg in *The Journal of the Royal Artillery*, January, 1923.

Pertinent articles in:

Current History for February, 1923:
1. "Europe's Tangled Problems," by Irving Fisher.
2. "Foreign Policy of the New Turkey," by Clair Price.
3. "Aviation Progress in America," by Rear Admiral W. A. Moffett, U. S. Navy.
4. "Cost of our Wartime Aircraft," by Major General Patrick, U. S. Army.
5. "Militarism in Central America," by Thomas R. Dawley.

The Fortnightly Review for January, 1923:
1. "Is the Washington Naval Treaty Doomed?" by Archibald Hurd.
2. "The Problem of Oil Supplies," by Sidney H. North.

Journal of the Royal United Service Institution for February, 1923.
1. "Jutland and the Principles of War," Translation of an article by Captaine de Corvette Richard.
2. "The Cruise of the *Wolf*," translated from the Revista Marittima.

Edinburgh Review for January, 1923:
"The High Command in 1914."

The Atlantic Monthly for February, 1923:
1. "Putting the Navy to the Test," by L. S. Mayo.
2. "A League of Nations or a League of Governments?" by L. P. Jacks.

Review of Reviews for January, 1923:
"Why We must Maintain the Navy," by W. H. Gardiner.

The World's Work for February, 1923:
"America's duty in the Near East," by Charles W. Eliot.

The American Review of Reviews for February, 1923:
"Talking over Pacific Problems," by Riley H. Allen.

NOTES ON INTERNATIONAL AFFAIRS

FROM JANUARY 23 TO FEBRUARY 23

PREPARED BY

ALLAN WESTCOTT, Professor, U. S. Naval Academy

FRENCH OCCUPATION OF THE RUHR

EXTENSION OF ALLIED CONTROL.—The February record of developments in the occupation of the Ruhr region by France and Belgium consisted of a series of riots, strikes, conflicts between French and German authorities, and extension of French control for punitive or other purposes. The more noteworthy events were as follows:

(1) The Reparation Commission on January 26 declared Germany in general and complete default, thus affording France and Belgium freedom to employ all measures and penalties prescribed by the Versailles treaty.

(2) The Occupation forces on January 27 established a customs barrier along the frontier between the Ruhr and the rest of Germany, with the object of regulating and collecting taxes on all exports. This was followed on January 31 by an embargo on all coal shipments into Germany.

(3) On February 4 the occupied region was extended by the seizure of the railway junctions of Oppenburg and Appenweier beyond the Strassburg bridgehead, thus giving control of the direct rail route from Frankfort to Switzerland. This measure was taken in retaliation for the stoppage of the Paris-Prague and Paris-Bucharest expresses.

(4) Following the visit of Premier Cuno to Essen, all members of the German state or federal governments were prohibited on February 10 from entering the occupied region.

(5) On February 13 at the opening of the British Parliament, Premier Bonar Law declared that France in entering the Ruhr was following a policy "disastrous not only to England but to herself and even to the economic life of Europe." The debate in Parliament indicated that all parties supported the government in its policy regarding the Ruhr occupation.

BRITISH POLICY.—At the opening of the British Parliament on February 13, Premier Bonar Law concluded his speech as follows:

"The French may occupy the left bank of the Rhine or the Ruhr for ten years, but if the net result is to intensify the feeling of German

nationality the danger will come later, and I do not think it is any advantage to France.

"We still have our troops on the Rhine. I do not know whether it would be possible for them to remain there long. Up till now it has not become acute, but it may. It is perfectly true that either the German or French Government could easily make it impossible for our forces to remain, but I think it would be a misfortune. While we are there we are at least in touch with the situation and have a chance of having a say in it. I think it would be a pity to bring an end to the Entente. It is no good appealing to the League of Nations if you are certain that France will have nothing to do with it. I am certain that that would be her attitude. It may be that in a few months' time they might look upon that as possible. If so, then, in my view, it would be time to make the attempt."

WHY FRANCE IS IN THE RUHR.—There is a party in France which is playing for the hegemony of Europe and much besides. Its ideals are pretty much what the ideals of Germany were before the war. Instead of the Bagdad Railway, there is the North African empire, with its reservoirs of fighting men to take the place of those. Germany, in her wild chauvinistic moods, dreamed of training further south. The difference is that the "copper" army of France is already a partially accomplished fact. But while France in North Africa grows, silently but steadily, there is Germany's economic example in her western coal and iron fields to be copied immediately, and bettered in the copying. That is one of the things which do not appear on the surface, for which France is in the Ruhr. Reparations? It would be a disappointment if these were forthcoming. But the indefinite exploitation of the Ruhr coal and iron fields in conjunction with the iron of Lorraine and the coal of the Sarre, of Briey, and of Longwy, this would make France the dominating industrial force in Europe, and reduce Germany to impotency. There you have one of the true reasons for the presence of General Degoutte's men in the Ruhr, for segregation of the Ruhr, and for certain other things, none of which are less actual because they do not appear in dispatches dated from the Quai d'Orsay. It was the Westphalian coal magnates, unable to get full value from their coke ovens, who combined with the general staff in demanding Lorraine, in 1871. The one wanted iron, the other a strategic frontier. Now, under the cloak of reparations, the directors of French industrialism reverse the process. Decidedly Paris has bettered the instruction of Berlin.—*International Interpreter,* February 3.

TURKEY AND NEAR EAST

TREATY TERMS SUBMITTED.—On February 1 the Allied draft treaty was presented to the Turkish delegates at Lausanne with the understanding that Lord Curzon would remain until February 4 to await Turkish acceptance. As finally presented the treaty modified the capitulation terms regarding foreigners in Turkish courts as follows:

Turkey engages to employ legal counsellors chosen from a list drawn by the Permanent Court of International Justice. These counsellors will participate in the preparation of legislative reforms and will be assigned to judicial districts of the courts of appeal at Constantinople and Smyrna and the ordinary courts of Samsun and Adana. They will not sit as judges, but will have the right to receive complaints from foreigners respecting the administration of the law and submit these complaints to competent Turkish authorities in order to insure strict observance of the Turkish code.

Arrests of foreigners must be executed in accordance with the views of the counsellors, while Turkey recognizes the legality of decisions in civil and commercial cases reached by outside arbitration.

Other concessions it is understood the Allies offered include:

1. Acceptance of the non-limitation of the the number of Turkish troops in Eastern Thrace, previously set at 20,000.
2. Reduction of the reparations of the Allies from 15,000,000 to 12,000,000 Turkish gold pounds.
3. Acceptance of the distribution of the principal of the Ottoman debt among Turkey and the so-called succession states, formed from the old Turkish Empire, without awaiting the consent of the bondholders.
4. Elimination of the clause in the Allied draft treaty whereby the Turkish Government would be required to ask the advice of the Council of the Ottoman debt in all concessions to Turkey or foreigners.

NO AGREEMENT REACHED.—Urgent appeals were made to the Turkish delegates to accept the terms as laid down. The French government, however, made it clear that France did not regard the treaty as an ultimatum, and that even if it were not accepted, negotiations might be resumed later on. In a note on February 4 the Turkish delegates offered to accept eighty per cent of the treaty and leave for further discussion the matters still in dispute, relating especially to capitulations, control of concessions, and distribution of the Ottoman debt. Hoping by what Lord Curzon described as "bazaar methods of bargaining" to secure further concessions, they refused to accept the treaty in its entirety.

After the break up of the conference, Ismet Pasha returned to Angora on February 20. It was expected that the Turkish government would make a detailed reply to the Allied terms, with the possibility of a settlement still in view.

SMYRNA CLOSED TO NAVAL VESSELS.—At the break-up of the Lausanne Conference the Angora government issued a notice demanding that by February 7 all foreign warships over 1,000 tons should leave the harbor of Smyrna. The Allied powers rejected this demand and sent naval vessels to reinforce those already in the port. The only American vessel in Smyrna at the time was the destroyer *Edsall*. After further protests and delays, the notice was finally withdrawn and the matter left for diplomatic settlement.

GREAT BRITAIN AND IRELAND

BRITISH DEBT SETTLEMENT.—On January 31 it was announced that the British Cabinet had accepted the American terms for the settlement of the British debt to the United States. In brief, these terms provided for the payment of three per cent interest and one-half per cent amortization fund for ten years, and three and one-half interest until final payment fifty-two years thereafter. The U. S. Senate on February 16 passed the British Debt Refunding Bill by a vote of 70 to 13. The

official summary of the provisions for settlement was given out as follows:

Principal of notes to be refunded	$4,074,818,358.44
Interest accrued and unpaid up to December 15, 1922, at the rate of 4¼ per cent	629,836,106.99
Total	$4,704,654,465.43
Deduct payments made October 16, 1922, and November 15, 1922, with interest at 4¼ per cent thereon December 15, 1922	100,526,379.69
Total	$4,604,128,085.74
To be paid in cash	4,128,085.74
Total principal of indebtedness as of December 15, 1922, for which British Government bonds are to be issued to the United States Government at par	$4,600,000,000.00

The principal of the bonds shall be paid in annual installments on a fixed schedule, subject to the right of the British Government to make these payments in three-year periods. The amount of the first year's installment will be $23,000,000 and these annual installments will increase with due regularity during the life of the bonds until, in the sixty-second year, the amount of the installment will be $175,000,000, the aggregate installments being equal to the total principal of the debt.

The British will have the right to pay off additional amounts of the principal of the bonds on any interest date upon ninety days' previous notice.

Interest is to be payable upon the unpaid balances at the following rates, on December 15 and June 15, of each year.

Three per cent semi-annually, June 15, 1923, to December 15, 1932, inclusive.

Three and one-half per cent semi-annually, June 15, 1933, until final payment.

For the first five years one-half the interest may be deferred and added to the principal, bonds to be issued therefore similar to those of the original issue.

Any payments of interest and of principal may be made in any United States Government bonds issued since April 6, 1917, such bonds to be taken at par and accrued interest.

IRISH AMNESTY ENDED.—The latest ten-day amnesty extended by the Irish Free State Government for the surrender of Irish rebels ended on February 17. President Cosgrove issued a warning of the government's determination thereafter to put down all revolt regardless of cost.

BRITISH CONTROL OF COTTON MANUFACTURE.—There is good authority for stating that during the last half century the world's demand for cotton goods has trebled. Naturally enough, many countries, including the United States, have entered upon cotton manufacturing for themselves. This development has not cut off British trade, but has merely produced greater variety and excellence in her fabrics. Today England owns, according to the estimate of Sir Charles Macara, nearly half the world's spindles, and exports about seventy-five per cent of the products of these spindles, as well as the dependent machinery, to all parts of the

world. These exports represent about a third of the total exports of the United Kingdom. On the other hand, America, possessing much British machinery and the pick of British technical advisers, and producing five eighths of the world's raw cotton, has not much more than half Britain's spindles, and an exportable surplus of goods of only about five per cent. The value of Great Britain's exports in 1920 was over £400,000,000. In the ten years preceding the war, Great Britain added 12,000,000 spindles to her total, considerably more than some countries have got together in the course of one hundred years; and in the decade preceding 1914, as many spindles were added to British resources as India, China, and Japan have got together in seventy-five years.

Sir Charles Macara points out that there are still in the world a great multitude of people only partially clothed so that there will be enough trade for all, the United States included, without the erection of tariff walls, and the facts enumerated above justify, in his opinion, the confidence of Lancashire in the future.—*International Interpreter*, February, 10.

RUSSIA AND NORTH EUROPE

MEMEL GIVEN TO LITHUANIA.—On January 31 the Allied Governments called upon Lithuania to bring about the withdrawal of irregular forces from the Memel region and the dissolution of the insurgent government which had been set up in the city. Subsequently, by a decision of the Council of Ambassadors on February 16, the district was awarded to Lithuania.

The Ambassador's statement says:

"The conditions laid down by the Allied Governments having been fulfilled, the Council of Ambassadors this morning reached a decision concerning Memel in accordance with the mandate of the Allied Governments. This decision awards sovereignty over Memel to Lithuania which certain conditions relative to the establishment of autonomy and the organization of sea and river traffic and the régime of the port in order to take account of the needs of the Lithuanian and Polish regions, of which Memel is the natural outlet."

POLES AND LITHUANIANS IN CONFLICT.—The Council of the League of Nations in session at Paris handed down at the beginning of February a decision providing for control and administration of the neutral zone between Poland and Lithuania. The decision called for the disarming of irregular bands in the district and division of administration between the two states. At the time of the decision, the Lithuanian delegate declared that Lithuania would use force to resist its execution, which led President Viviani to threaten the penalties of blockade prescribed in Art. XVI of the League Covenant.

Poland subsequently occupied the zone allotted to her, and on February 18 there were reports of serious hostilities between forces of the two nations.

INTERNATIONAL AGREEMENTS

NAVAL TREATIES RATIFIED.—The Italian Chamber of Deputies on February 7 and the Italian Senate ten days later ratified the Washington

Naval Treaties. It was expected that France would shortly follow the example of Italy. Extracts from the report of the French parliamentary commission assigned to study the treaty are given as follows:

The report, which was drafted after thorough discussion in the commission, is believed to represent the sentiments not only of the commission but of the Government. It includes a reservation similar to that adopted by the American Senate, designed to leave France free from obligations of any armed co-operations. The reservation reads:

"The attached texts do not obligate France to any armed co-operation. They do not imply any alliance for any obligation to participate in defensive action."

The report, in presenting this reservation and referring to the American Senate's action, says:

"The French Government in its turn accepts the view that in case of difficulties the treaty contemplates only friendly conversation, and does not imply obligation to intervene by arms in case of conflict."

The report reviews the history of the Washington accord, sets forth its objects and the reasons for its existence, and comments that the tripartite accord was enlarged to include four signatories only after France had presented arguments to show that she was a great Pacific power and entitled to participate.

The accord applies only to the islands in the Pacific, the report remarks, "and if France were attacked in her continental possessions she would not even have resort to the conversations that ought to precede, and possibly avoid, a rupture."

"France, in such an instance," it continues, "would be aided in her relations with Japan by the treaty concluded with that power on June 10, 1907, which constitutes a guarantee whose value cannot be disputed."

ITALY IN THE ADRIATIC.—On February 16 the Italian Parliament completed ratification of the Agreement of Santa Margherita with Jugo-Slavia, which practically confirms the *status quo* in the Adriatic region. Italy evacuates Sussak but retains the Delta Porto Barros so long as Fiume insists on being internationally recognized as an independent state. Mussolini spoke of the treaty in the Senate as follows:

Turning his attention to the situation in the Adriatic, Mussolini said that foreign policy must not be swayed by sentiment.

"We must have the courage to recognize that Italy cannot remain in the Adriatic," he said, "There are other seas.

"The agreement of Santa Margherita at least protects the Italian language in Dalmatia, and, as our eminent statesman and author, Signor Gioberti, has said, where language is there is the nation. We will apply the agreements loyally and scrupulously, but we expect equal loyalty and scrupulousness from Jugoslavia."

The Premier reverted to his favorite theme when talking of the treaty with Jugoslavia, namely, that all treaties can be revised.

"Treaties are compromises," he said. "No treaty is perfect, just as no treaty is eternal. Even events which are happening in Europe today teach us this lesson.

"I must say that since the advent of the Fascista Government to power Jugaslavia has showed herself less intrasigeant. My Government does not avoid difficulties; it faces them.

"We must never believe that anything is irreparable. Ancient Rome did not believe that the defeat at Cannae was irreparable. Rome fell,

but she rose again. So must Italy prepare her spirit and her strength to dominate her future destiny."

WORK OF LEAGUE COUNCIL.—The League of Nations Council opened its twenty-third session in Paris on January 29 and closed on February 3. Among matters decided or discussed may be noted:

(1) Amendment of Article X. It was decided that member nations be requested to submit observations in order that a report might be submitted at the fourth plenary session of the Assembly.

(2) Naval Conference. It was decided to call a conference of naval powers not signatories of the Washington Treaties, the date to be set after the Pan-American Conference at Santiago.

(3) Hungarian frontier. Hungary and Czecho-Slovakia accepted the procedure proposed by the Council for settlement of their boundary dispute by a special commission.

(4) Armament Expenditures. Member nations were invited to limit armament expenditures so as not to exceed the amounts appropriated in 1913.

(5) Settlement of Polish-Lithuanian Frontier. See treatment elewhere in *International Notes.*

(6) Rehabilitation of Austria. A report was submitted showing stabilization of Austrian currency, reduction in cost of living, and increase of savings. Austria was authorized to borrow from international bankers £3,500,000 on security of customs and railroad receipts and underwritten by Britain, France, Italy, Czechoslovakia, Spain, Belgium, and Switzerland. This is the first of a series of similar loans to total about $150,000,000.

UNITED STATES AND LATIN AMERICA

NEGOTIATIONS FOR NICARAGUAN CANAL ROUTE.—Washington, Feb. 7—Negotiations with a view to clearing away the complications that had been threatened by the opposition of Costa Rica, Salvador and Honduras to the Bryan-Chamorro Treaty between the United States and Nicaragua for a new interoceanic canal route across Nicaragua have been quietly and successfully conducted by the Harding Administration during the meeting in Washington of the Central American conference.

While no official announcement of the result has been authorized, it is understood that the negotiations have reached a very successful stage. Since the Bryan Shamorro treaty was ratified by the Senate on February 18, 1916, with a reservation to the effect that nothing in the Nicaraguan Canal route treaty was intended to affect any existing right of Costa Rica, Salvador and Honduras, it will be necessary to seek the advice and consent of the Senate to such agreements as flow from the negotiations in which the State Department has been engaged with a view to overcoming the protests which were made by those nations.

The Bryan-Chamorro treaty was negotiated during the first Wilson term by former Secretary Bryan and General Emileano Chamorro, who acted both as President of Nicaragua and special envoy to Washington to negotiate the treaty. It was signed at Washington on August 5, 1914, and granted to the United States in return for a money payment

of $3,000,000 to Nicaragua the exclusive proprietary rights necessary for the construction, operation and maintenance of an interoceanic canal by a Nicaraguan route, the lease for ninety-nine years of Great and Little Corn Islands in the Carribbean Sea and the right to establish a naval base on the Gulf of Fonseca.—*New York Times,* February 8.

CENTRAL AMERICAN CONFERENCE ENDED.—The conference of Central American states, begun at Washington on December 4, ended on February 7. The results of the conference consisted chiefly in revival or extension of agreements made in the previous conference of 1907, including a general treaty of peace and amity, and an agreement not to recognize governments set up by revolution in defiance of the constitution. A Central-American Court of Justice for international disputes was established, with provision that other international problems be dealt with by a Central American Bureau. It was provided that armies be reduced to 5,200 for Gautemala, 4,200 for Salvador, 2,500 for Honduras, 2,500 fo Nicaragua, and 2,000 for Costa Rica.

AMERICAN ISOLATION.—There was something peculiarly forceful about the way in which Mr. Frank O. Lowden, former governor of Illinois, put the much discussed question of "American isolation," in the course of a speech in New York, the other day. "If we are willing to pay the price," declared Mr. Lowden, "maybe we can get back our isolation. But let me tell you the price. It would be the reversion of thirty per cent of our wheat fields and twenty per cent of our corn fields back to the native prairie land. Fifty per cent of the cotton fields of the south would go back to the original forest; we would close up a lot of copper mines; and we would have to revolutionize completely our industry and commerce if we would regain that isolation which we long ago lost. Are we willing to pay the price?" If Mr. Lowden errs at all, it is, surely, on the side of moderation. It is safe to say that the price would never be paid; that, long before any position had been reached such as that outlined by Mr. Lowden, economics would have reasserted their control of politics.—*International Interpreter,* February 10.

FAR EAST

RUSSIAN MISSSION TO JAPAN.—On January 26 it was announced that M. Joffe, the Russian diplomat, was to leave China for Japan, on a special mission. The visit of Joffe is connected with that of the Japanese envoy Kama-Kama, who recently went to Moscow with tentative proposals for evacuation of northern Sakhalin and opening trade relations.

Recent events have convinced the Russians that they hold the winning cards, or are playing them more successfully, and the best informed Soviet officials now say that the only thing that could hinder Russo-Japanese negotiations on the Russians' own terms—which means Japanese evacuation of Sakhalin in the not too distant future—is a general accord between the United States and Japan to parcel out the Western Pacific into spheres of influence on the lines of the Anglo-Russian accord in Persia before the war. This the Russians do not consider probable.—Walter Duranty in *New York Times,* February 16.

REVIEW OF BOOKS

"AN INTRODUCTION TO WORLD POLITICS" By Herbert Adams Gibbons, The Century Company, New York. Price $4.00.

Review and Interpretation

Foreword

On behalf of the Naval Institute, the review of this book was undertaken. In reviewing it, the thought has been that it was written for naval men to read. I have therefore taken the liberty of reading a little more into this article, in the shape of naval lessons, than a strict review would warrant.

W. V. PRATT,
Rear Admiral, U. S. N.

It is rarely that one runs across a book so full of historical material and so useful, in an educational sense to the older naval man. The author has truly said that this is an introduction to world politics. Of the very nature of things, one book could not be more than that, but the arrangement is such that a clear and continuous picture of world political events, particularly those of Continental Europe, is given to the thoughful reader. In addition to the facts which the author so succinctly presents, he gives his own views of the results of the application of world politics to the various nations and races of this earth. To this extent the book is more than an introduction, it is at least a partial attempt at an interpretation of world politics. If one may glean what is the author's definition, it might be said that world politics is the game of national interests played by the powers of Europe since the end of the eighteenth century. The birthplace of the game was Europe. Minor and backward nations have been the pawns. The players were statesmen. The world was the game board, but the controlling threads always lead back to Europe.

It is necessary to remember the above conception of world politics if one is to apply the lessons of the past to the problems of the future, for it indicates clearly that no American, brought up in a country singularly free from the influences which have controlled the policies of Continental Europe for over one hundred years, can, in the realm of world politics, on equal terms, cope with the foreign diplomats and statesmen who breathe this atmosphere from childhood on, and who sharpen their first set of diplomatic teeth on the problems of the Near East.

This book is of much value to the naval officer who is interested in the study of international questions and who wishes to have a correct background upon which to base his naval strategic studies. It does not replace Mahan, but it does furnish a setting in which we see portrayed the naval

lessons Mahan so skilfully drew out of the history of the past. While not viewing his problem in the light of a naval man, or even necessarily being in sympathy with him, the author has made such a clear analysis of the relationship existing between naval strength and world politics, as it was played in Continental Europe, that he has practically arrived at the same conclusions which Mahan, our great sea strategist, reached. Before attempting to read the book at length, it is recommended that some study be given to the list of contents in order that one may get an idea of the general scheme, or perhaps it might be said, the atmosphere of the book. Ancient history is not touched, though it, particularly Roman world history, furnishes lessons pertinent to the present age. Little space is given to the older colonial conquests of the British, Spanish, French, Portuguese, or Dutch. No attempt is made to form a connecting link between the limited political aspirations of nations before the French Revolution and the world politics of the more imperialistic age following after. In reading this book one should not attempt to find world politics explained or justified by any continuous thread which runs back through a long past. The Spanish and Portuguese relations to their Colonies were so different from the conceptions of world power which came into being about the time of the French Revolution, and which have existed since then, that they have been barely touched upon. Insofar as the scope of the book is concerned, this would be unnecessary if, in some of his later chapters, the author had not appeared to interpret world politics with a view to deriving lessons applicable to international problems of the future. The instant we attempt to speculate about the future it is inevitable that the United States and other countries of North and South America should become involved. The history of the colonial expansion of North, and particularly South America, is so interwoven with the older world policies of Spain, Portugal, and France, that it is impossible for the political atmosphere of the new world not to be tinged with the policies and practices of an older time. So it may be said of North and South America that they, at a period before the one so intimately analyzed by the author, acquired a political complexion of their own, which later as independent states they have proceeded to develop undisturbed to any great extent by the more complex problems which have agitated Europe since the end of the eighteenth century.

Dating from the Act of Vienna in 1815, it may be said that a new colonial policy arose in Europe. Previous to the Napoleonic wars, much of the colonial expansion which had been undertaken, except in North America, was carried on for the purpose of proselytising the natives or of enriching the coffers of the mother country from the stores of gold, silver and other valuables found in the overseas colonies. During this period many wars were fought, but up to the nineteenth century most of the wars were fought for limited objectives. The entire nation rarely felt the full stress and effect of war. The Napoleonic conception of world conquest, resembling somewhat the Roman, changed this situation. His ambitions were unlimited, but his appreciation of the factors constituting world power was faulty. Napoleon never appreciated the true value of colonies or of sea power.

The point to remember is, that following the Napoleonic era, the world gradually became the stage of operations, and the era of world politics was born. After 1815 there came a period devoted to the consolidation of gains; the value of colonies as a world asset to a nation became more thoroughly appreciated and the relationship of sea power to world power recognized. The result was that the colonial expansion after 1815 was of quite a different character from that which antedated the Napoleonic wars. In the inter-relationships existing between national aspirations, colonial expansion, industrial expansion, trade, sea power, and military power, you get the tangled threads out of which the statesmen of the day wove the web of European world politics.

In the discussion of national aims and practices from 1815 to the date of the Washington Conference in 1922, the author has gone as deeply into particulars as was necessary to give his story the thread of continuity. Where details are required, he has referred the reader to the sources of more particular information. However, sufficient data have been given the average reader to follow the trend of the story.

Though modern world politics, in the sense used by the author, has touched North and South America but slightly, its mantle was spread quite definitely over Asia. It may be that our Continent owes partial immunity to that cycle of political events, the American Revolution, the French Revolution and the Monroe Doctrine. One cannot read this book, or in fact, any history, without seeing that Great Britain has been the dominating factor in modern world politics.

From the beginning of the seventeenth century, Holland had extended her commercial sway into the Far East and into the Americas through the agencies of the Dutch East and West India Companies. Her fleets contested, and for a time successfully, under Tromp and De Ruyter, the supremacy of the seas with Spain and with England. The Napoleonic wars ended disastrously for Holland. Her forced alliance with France gave the British the opportunity to seize much of the overseas holdings of the Dutch as they were helpless against England's sea power. The Dutch East Indies were restored and are today the world's richest island empire.

The battle of Trafalgar in 1805, won by the great Nelson, broke forever the sea power of France and Spain, leaving Great Britain mistress of the seas. Blessed in the possession of many world strategic positions, and in the greatest sea fleet, the road to India lay open. Her other colonial possessions were equally accessible. Wherever the native islander could settle he brought from his native soil a bit of the homeland. These overseas Dominions, settled by native stock, today constitute the strength of the British commonwealth. In colonies such as India, already densely peopled by native races, Great Britain's colonial policies were different. They were administered through various agencies as a part of the property of the Empire, but never enjoyed Dominion rights. British colonial expansion, however, was well in advance of the times, and the territories

over which she ruled, in the main, received a wise administration. Through the impetus given by colonial expansion, it was natural to see a great carrying trade established between the colonies and England. With the disappearance of the American merchant marine following the Civil War, Great Britain had hardly a competitor until the merchant marine of Germany began to make its power felt. With the growth of her colonies, and through the agency of her merchant marine, it was natural that England should develop as a great industrial country, with the trade and money of the world flowing toward her. Her safeguard was the British Fleet. It not only protected Britain's shores, but it backed up her diplomatic efforts in peace, and forced her opponents to strain every effort in war. Her own resources up to the time of the Great War had never been taxed to the utmost. In time, Great Britain practically took the middleman's toll of the commerce of the world. Afterwards came Russia, France, Italy, and other lesser powers, and at a later date, Germany. But, whether the exploiting nation were governed by an autocrat, or administered under the laws of a republic, or of a constitutional monarch, the aims have not been dissimilar. At the root of each national policy was the controlling idea that the native peoples might be exploited for the benefit of the mother country. As a by-product, in the processes of exploitation, the native populations, where such existed, were supposed to be benefited by the superior civilization of the greater power. It was not the difference of aims, but the difference of methods used, and the character of the colonizing stock, which made Great Britain's colonies successful in contrast to the colonies under the jurisdiction of other powers. In a practical sense, while the colonies of Great Britain have advanced, those of the other great powers have not kept pace. The awakening sense of national and racial consciousness which is making itself felt, particularly in Asia, will force the world politics of the past to come to a different adjustment of values in the future. The Continent of Asia has not been free from the influence of world politics to the same extent as have the North and South Americas, and in the future may present many interesting and complex international problems. As the French and the English have in the past been the greatest exponents of world politics, so they are at present. The problems of the Near East are today but a continuation of the problems which have been vexing the Balkan and other neighboring states for centuries. The relationship of France and England to these questions, is today, on the whole, what it was in the past before Germany entered the scene. The policy of Russia, owing to the great débacle, has been completely overturned. At one period in her history she appeared like a giantess endeavoring to shake herself loose from the bonds which bound her, in an attempt to seek an outlet to the four seas. This striving to gain access to the seas usually conflicted with the policy of Great Britain, that could brook no power which might threaten her sea supremacy. The interests of France lay sometimes with one and sometimes with the other power, but in the main, France aspired to be a dominant continental power while England aimed to control the seas.

With the Americas closed to European colonization projects, and with Asia preempted by native races, Africa loomed large in the world political horizon. The Suez Canal opened a short road to India. French and British interests clashed at intervals. In emulation of France, Italy took over to herself certain holdings in Northern Africa, on the Red Sea, and Gulf of Aden. Portugal, Belgium, Spain, and later Germany, appropriated vast territories. The clash of national interests was felt from time to time.

The Balkans and Near East were always fruitful sources of trouble. Wave after wave of conquest had swept over this part of Europe and Asia Minor. Racial and boundary difficulties had vexed the Balkans for centuries. When the great powers started playing one small nation against another, in the game of world politics, fresh fuel was added to the flames. Two late wars had pitted the Balkan states against the Turk and then against each other.

Germany and Japan came late. Germany had been too engrossed in her own problems of internal development and consolidation to seize upon the valuable outlying possessions of the world, when the opportunity to grasp them was good. Under the guiding statesmanship of Bismarck, the German Empire, in a manner somewhat similar to Russia under the autocratic régime, was to expand outwardly from the Empire as a center. The natural direction of expansion was toward the East and Southeast, and this led to the desirability of reasonably friendly relations with the great Empire of Russia and to close ties with Austria. With the passing away of Bismarck conceptions of correct German policy, the lessons gleaned from a study of British methods took firm hold on the directing German imagination. The nature and value of sea power began to be understood. But the world was small. The best unoccupied places had already been preempted, and there arose, naturally, a state of tension when another competitor entered into the field of European ambitions. So long as the clash of interests occurred in overseas possessions, while the danger of war was ever present, it was not inevitable. But the instant that commercial rivalry became too great, and Germany's sea power menacing, the danger grew. When Germany directed her attentions and interests to the Near East, always the source of Europe's troubles, war was almost inevitable. In pursuing her line of conduct, Germany took a leaf out of the history of England and France. But she had neither the political astuteness nor the backing of experience, to enable her to play the game as skilfully as it had been played before. The author is inclined to excuse Germany on the ground of precedent. It would seem fair, perhaps, to excuse German aims; yet the German methods were, to say the least, unsportsmanlike.

Japan, as a world power, also arrived late in the world political arena. Her acquaintance with modern occidental civilization of less than a century's growth, could not be thorough. To a young power, spreading its wings and learning to fly under the modern methods of world politics, it must have been apparent that the law of nations was the law of force.

At least, this is the conclusion which a nation studying European methods of the past century and a half must arrive at. Probably for these reasons the author has made excuses for the attitude of Japan toward Korea and China.

The Russo-Japanese War marked an epoch in Asiatic political history and showed Japan her military strength, which she was not slow to use for her own ends, during the late war. It seems fair to believe, however, that no country like Japan, with over two thousand years of splendid continuous historical or traditional record behind it; of a racial purity and imbued with sterling qualities; with a national spirit which permeates the Empire, will in the end draw conclusions from the historical lessons of the past which do not accord with the future advance of civilization.

Toward the end of the nineteenth century and with the rise of Germany, there developed a competition for the markets of the world which resulted in intensive production and a consequent industrial inflation. This industrial inflation affected many of the white races, inducing a tendency to move away from the soil, and to gather in cities. There they could engage in occupations which apparently gave a larger share of the luxuries of life. Other nations were ready to see the advantages enjoyed by Great Britain, and were quick to follow her lead; but the best spaces of the world already had been preempted. Although wars, as for example our Spanish War, which first brought America into the realm of world politics, and the Russo-Japanese War, which marks the turn of the tide in Asiatic policy, had been fought, no great European War between the powers had taken place since the Franco-German War of 1870. There had been, however, warnings from time to time that the state of peace in Europe was not resting on stable foundations. The intense commercial and political rivalries of the early twentieth century furnish the foreground of a picture, of which the background is made up of national aspirations pursuing selfish ends for over a century of world political history. Finally a combination of interests aligned Great Britain, France and Russia on the one side, and Germany, Austria and Italy on the other.

By 1914 the inflammable materials for war had been accumulated; the train was laid, and it needed only the spark to set Europe ablaze. Serbia furnished the spark. The devastating World War followed. Many of the pre-war policies were submerged for the time being. As is always the case in great crises, an appeal to emotions and to ideals will call to the instincts of man more strongly than do material things. When life and all are staked in the great game, the value of material things vanish. This has been true in the religious wars of the past, and probably will repeat itself in the future. Therefore, it is to be expected that many of the material causes which led to the war, should disappear in the ideals created after the war began. These facts should be kept in mind, for they may help to explain the waning of that idealism, which, binding the Allies firmly during the later and more trying days of the war, began to disappear with the signing of the Armistice.

If we may judge from present and past history, while the other nations of Europe have run somewhat true to form, Russia has been an exception. Even during the war she reversed her policies toward her Allies. It is probable that the great upheaval in Russia marks a new period of European History, as did the French Revolution over a hundred years before it. Students of world politics cannot afford to leave Russia out of the reckoning in dealing with future international conditions. The war has left all of Europe the poorer, and much of it in a chaotic condition. Out of the war have emerged new countries, new national boundaries, new alignments of interests; but the same old national and racial animosities exist, and the same world problems clamor for solution. In certain countries the militaristic spirit still dominates. In others, the birth of a new nationalism is evident. In still others, socialism has run mad. The European world seems to be striving to find a way out, but co-operation is lacking.

With the signing of the Armistice the day of the warrior passed, and the reign of the diplomat and statesman began. Coincident with the passing of the military situation brought into existence by the World War, the idealism which had actuated the men of all the warring nations, began to disappear. The same spirit which had controlled world politics for centuries was responsible for the treaty of Versailles. In the atmosphere of Versailles the League of Nations, conceived as a great ideal and as a solution for the ills which world politics had inflicted upon Europe, started on its world career. Under such conditions it was natural that many of those lofty conceptions should be modified to meet the demands of local interest. America would have none of it. She desired neither to be entangled in European politics, nor to have imposed upon her sovereignty the authority of a super-state. As a panacea for Europe's ills, or those of the world, the League of Nations has not solved the problem. Neither would the problem have been solved had America participated as a member. Unless the spirit which animates the League be different from that which has influenced the world politics of the past, the problem will not be solved after this fashion. Nevertheless, every participant in the Great War has a task to fulfill, which did not cease with the ending of the war. That duty is to see that world conditions are stabilized in the interests of a just and enduring peace, so that civilization may advance, and man live a normal life at peace with his neighbor.

When the Washington Conference was called in 1921, there existed two spheres of world political unrest. One was the Near East, and one the Far East. In the Near East we find the same national animosities, the same clash of interests, that existed before the Great War. Though they strive to keep alive the alliances brought into being during the stress of war, the same national attitudes toward world politics affect France and England today, as they did before Germany grew to be a world power. The problem of the Near East is ages old, and cannot be settled in one generation. In the Far East no enduring political animosities had affected

the relationship beween the United States and Japan. Consequently, the question was one far easier of solution than the Near Eastern problem. The way of the Washington Conference may have been a crazy way, but it certainly was a new way, and it was a method which had never been adopted by any of the great powers before, in their dealings with other nations. The atmosphere of the Washington Conference was free from the sinister influences which world politics had imparted to conferences held in Europe. As the initiator of the Conference, it was fitting for the United States to take the lead and to make radical and definite sacrifices, in the interests of stabilizing conditions in the Far East, and of promoting a peace in the Pacific Ocean which should be lasting. Therefore, the national sacrifices made in the interests of stabilizing Far Eastern conditions are not to be measured in dollars and cents or in material values. Their value lies in the imponderables. But it is a fact that through the very material sacrifices which the United States made, a spirit of fairness, of good feeling, of give and take, was created, which has had the result of relieving the tension in the Far East, and may be productive of a peace which, it is hoped, will last for many years. The spirit of the American Open Door policy has received a new lease of life and an impulse, which may make its principles a potent force in the future. Perhaps a way has been paved toward the solution of many perplexing Far Eastern questions. The Conference marks a new departure in world politics, and it indicates a way of adjustment more in keeping with the spirit of the times, the needs of humanity, and the interests of smaller nations, than do the methods which have controlled the world politics of the past.

Perhaps the best and strongest chapter is Chapter XLVII, entitled, "Basis of Solidarity among English Speaking Nations." It is, without doubt, the most constructive chapter in the book. In it the author states, "The creation of a sentiment of solidarity among the peoples of the English speaking world will do more to improve international relationships generally, and to hasten the era of a durable world peace, than any other concrete proposal that has been advanced." The bases of solidarity are: "(1) common laws and the same spirit of administration of justice; (2) similar development of democratic institutions; (3) common ideals, and (4) common interests." This idea of the author is constructive, sane, and sound. It makes no appeal to the racial minorities within our states, nor should it arouse the hostility of those who come to America to become its citizens, obey its laws, and abide by the traditions and principles upon which our great American commonwealth is founded.

In reading between the lines, one cannot fail to see the part which sea power has played in the era of world politics. It has been the power behind national policy. It was the tool of the statesman in peace. It was the weapon which, in the hands of naval men, imposed the will of a nation upon an opponent in war. It twice saved Europe from militarism, and often dictated the terms of peace. It spread occidental civilization over the world. In the future, if America is to play the part in international

questions which her destiny indicates she must play, her sea power will be a potent factor in making her ideals felt.

Finally, the book is sound. In the main, the interpretations by the author, of the lessons learned from world politics, are good. It is a book which should be read by every naval man who wishes to inform himself of the outlines of modern world politics, in order that he may be the better servant of his country in the future. In writing this review it has been the intent to stick to the facts, and to the periods treated in this book. If, in the endeavor to read between the lines and to offer interpretations, this review has differed from the spirit of the author, or has recorded opinions which will not bear the test of analysis, apologies are offered.

LA GUERRE DES CROISEURS, par le Capitaine de Fregate P. Chack, Du 4 Aout 1914, A La Bataille Des Falkland avec Atlas, Augustin Challamel, Editeur.

A REVIEW BY REAR ADMIRAL ALBERT GLEAVES, U. S. NAVY

This book is published under the direction of the General Staff of the French Admiralty, and bears the stamp of earnest, painstaking research, and accuracy of detail. It consists of a volume of more than 300 pages, and a separate volume of charts. The period covered is only about eight weeks. Captain Chack was fortunate in having the official histories of the British, German, and Japanese to consult; and to all he makes full acknowledgment. The Japanese account of the Naval War, he states, is in three volumes, but it has not yet reached this country. The well-known Captain Castex of the General Staff has written the preface. It is a graceful foreword to Captain Chack's book, and highly compliments the author on the success of his brilliant labors. The interest and value of the book is heightened by footnotes, telegrams, letters, etc.

The charts deserve special mention. They are admirable, especially in the unique method in which the development of events is presented, each chart covering a period of two weeks, following the outbreak of war. No ship tracks are plotted after the conventional, but for the most part incorrect and misleading custom. In the charts under consideration the cruises of the various ships and divisions are merely indicated by a few colored lines and curves and arrows. Chart I presents the location of the belligerent cruisers during the period of tension up to August 5, and shows the first concentration of the various forces. The *Karlsruhe* is depicted leaving the West Indies; the *Dresden* is standing down the northeast coast of South America; the French and English ships are leaving Mexico, etc. In the Pacific Von Spee with the *Scharnhorst* and *Gneisenau* are in the Caroline Islands awaiting developments, the *Nürnburg* is en route from San Francisco to join him, and the *Leipsig* is on her way up the coast from Mazatlan. The *Königsberg* is between Zanzibar and Aden, and the *Emden* is near Tsingtau. The British Squadron is concentrated

at Hong Kong, the Australian division at Sidney, and the Cape Squadron en route from Mauritius to Dar-es-Salaam. Chart II shows the great ocean trade routes, the focal points of sea-borne traffic, and the zones of observation.

The Atlantic Ocean was divided by the Germans into five zones, I-V. It was divided into eight zones by the British, lettered A-H.

The plan of the book is simple. In a modest introduction the author states the scope of his work. First he tells the story of the German attempt, more or less successful, to prevent the Allies' colonies from sending troops and supplies to Europe, and next he describes in detail the measures taken by the Allies to keep open and safe the principal trade routes, and and at the same time their efforts to capture or destroy the German Merchant Marine. He discusses with remarkable cleverness the confusion into which the finances of the world were thrown by the war, and their profound effect upon the world's economic equilibrium.

A statement of the cruiser forces engaged and their stations overseas is followed by a sketch of the period of tension immediately preceding the declaration of war; this comprises an account of the observation of ports where there were German ships, the concentration of the various squadrons on foreign stations, and the reaction on trade. The succeeding chapters cover the periods of two weeks each, into which the author divides the time covered by the book, in which the various operations of the belligerents are described in detail. The author states that the Japanese history of their naval war with Russia comprises no less than one hundred thirty volumes, as a precedent perhaps for the minute detail of his own history.

"No wars of former times," observes Captain Chack, "have developed such naval effort; no other conflicts, even the most gigantic, will see the result depend so entirely upon the freedom of the seas." On the great ocean routes of trade and their extensions, and in those regions where the density of traffic was greatest was naturally where the heaviest blows would be struck. The British Admiralty was keenly alive to this, and when the war clouds gathered and the British and German cruisers were lying off Vera Cruz in the summer of 1914, it impressed upon Admiral Cradock the importance of keeping in touch with the Germans that they might not escape if war came.

The task allotted to the Allied cruisers was tremendous. They blockaded, visited and examined suspicious ships; convoyed troops, protected merchant marine, patrolled the trade routes, guarded their distant colonies, co-operated with expeditions against the enemy's colonies, and assisted to gain control of the sea. The German cruisers had a simpler, but not less difficult problem; their mission was to isolate the enemy by destroying her commerce.

The insular position of England, and the fact that the richest departments of France had been invaded at the beginning of the war, made both countries more than ever dependent upon the uninterrupted flow

of overseas trade. Therefore the freedom of the sea was a life and death question to them. Thus a tremendous responsibility devolved upon the Allied cruisers, and until the safety of sea transportation was assured, their main objective was the German ships on the high seas.

Captain Chack points out the hard luck the Allies played in at first in their efforts to capture or destroy the German cruisers and swift auxiliaries. Their experience reminds one of the old saying that the English lose every battle but the last. Repeatedly the German ships escaped by narrowest margin. The *Emden* after leaving Tsingtau ran so close to a British squadron in a fog that she crossed their foaming wakes, and again in the Gulf of Bengal she just missed running into the *Hampshire*. It was so in the West Indies at the beginning of the war, when the *Bristol* all but captured the *Karlsruhe;* the ships sighted each other in the moonlight and an indecisive action followed, which ended in the escape of the *Karlsruhe;* and so also in the channelways of Tierra del Fuego when the *Dresden* got away from Admiral Stoddert's ships. In evasion and flight from superior force the Germans showed great skill. The conduct of their cruiser warfare reflects credit on their pre-war plans. They never seemed to experience any trouble in establishing their rendezvous with colliers and supply ships, and they sustained themselves largely on the stores from their prizes.

The most successful of the German commerce destroyers were the *Karlsruhe* and the *Emden*. Each destroyed or captured sixteen British ships, of 72,805 and 70,360 gross tons respectively. The *Kronz-Prince Wilhelm* had 30,728 tons to her credit, and the *Dresden* 11,266.

The author accounts for the difference between the sinkings of the *Karlsruhe* and the *Dresden*, both operating in the same region, by the fact that the ships pursued different methods of cruiser warfare. The *Karlsruhe* reaped a harvest of British ships at the focal point of the trade routes off Cape San Roque; her game was to sink as many ships as possible, and to withhold the news of the work and her own whereabouts to the last moment. The *Dresden* on the other hand contented herself with fewer sinkings, but she spread the news as quickly as possible by sending in immediately the survivors, and hiding herself in the unfrequented waters of the south Atlantic. The *Emden*, though most brilliant of all the sea-wolves, combined the two methods; she equalled the number of captures of the *Karlsruhe* and threw into a panic the entire traffic of the Indian Ocean and the Western Pacific. Captain Chack surmises that both methods were authorized by the German Admiralty, and he inclines to the belief that the *Dresden* method was better in its final effects on the war.

The book is a notable addition to the literature of sea warfare. It is hoped that it will be translated into English by some naval expert, and placed in the library of every ship in commission. It merits a cordial reception by our Naval officers, and the author is to be congratulated on the thoroughness and excellence of his work.

THE WAR IN THE AIR, Vol. I, by Walter Raleigh, Oxford University Press, American Branch. Price $7.00.

A REVIEW BY REAR ADMIRAL W. A. MOFFET, U. S. NAVY

The history of aviation development is daily in the making. Within the past ten years the possibilities of conquering the air have only been envisioned if we are to judge by the almost daily achievements which are recorded. It is well, however, even in the midst of the rush of present development to pause and survey the past and gain thereby a perspective of the future.

The War in the Air deals intimately and in detail with the development of the British Air Force and as such constitutes a valuable addition to the history of aviation. A painstaking record of this nature is not only of value for the detailed information and facts that it contains but it enables the reader to study from perspective the building of a great war machine under the stimulus of necessity, and clearly presents the difficulties encountered, the heroic efforts put forth to surmount obstacles, and the success which crowned those efforts.

The first chapters are of exceptional general interest. The author traces the development of aviation from the time when men first dreamed of the possibilities of flight down to the successful experiments of the Wright Brothers in this country. In these chapters he has successfully presented the romance of aviation in a narrative style which captivates the interest and stimulates the imagination.

His advocacy of the policy of a United Air Force in Great Britain is somewhat less fortunate in the light of recent events. A defense of this policy, which has of late been under such a withering fire of criticism from all quarters in England, gives a flavor of bias to an otherwise admirable and disinterested work.

THE WASHINGTON CONFERENCE, by Raymond Leslie Buell. (D. Appleton and Company, New York. $3.00).

A REVIEW BY COLONEL GEORGE C. THORPE, U. S. MARINE CORPS

If there is any need to introduce Raymond Leslie Buell to the American reader, especially after his *Contemporary French Politics*, that introduction might be summarily accomplished by characterizing him as the epitomizer *par excellence* of world politics.

His books cannot fail to impress any cosmopolite with his remarkable capacity for mobilizing facts from the far corners of the earth.

The importance of having all the facts—pertinent facts—available for the one who would estimate a situation is now a quite trite observation for our trained Navy and Army officers. The readers of the *Washington Conference* is impressed with the conviction that Mr. Buell—or Professor

Buell—has illuminated the important international facts against the background of the whole massive conglomeration of years of intrigue and racial strife.

The book is not only blessed with the virtue of logical arrangement but is as intensely interesting—one might say thrilling—as any of the best sellers. It presents a vivid picture of the workings of the master statesmen of the Occident and Orient in Washington assembled for the great conference and it prepares the reader for a true understanding of their parleys by spreading out an elaborate array of important incidents, especially in the Orient, that count as causatives.

For the officer student at our war colleges, either just getting his introduction to the subject of *Policy*, this is precisely the book to show him the fascinating mental exercise he is coming into. And it certainly will make his task easier for, blessing of blessings! it has an appendix that is a veritable encyclopedia of diplomacy *re* the Orient.

Of what immense importance it is that the American public appreciate the purport of these incidents! Hear a quotation from the first paragraph of Chapter I, wherein General Jan Smuts, "one of the most farseeing statesmen of the present day," is represented as declaring that "the problems of the Pacific are to my mind the world problems of the next fifty years or more," thus verifying the prognostications of an American statesman of nearly a century earlier. General Smuts' statement is the more significant in having been made at the last Imperial Conference of the British Empire. He was merely tolling the funeral bells for the departed *first-class* powers of Europe who may be theosophically coming forth in a new birth as second-class brats.

One need not assume an abstruse attitude of mind, nor yet stimulate the imagination, in perusing the *Washington Conference*, to see with perfect clearness that the great theater is now the Pacific and that our own fair Columbia is the dazzling *prima donna*. In fact, we see her coming into her own quietly and gracefully, with no climber effort, scarcely aware of all her alluring power to impose her will. Without effort, a great duty of leadership is imposed upon her—who is so capable and qualified for world leadership, and so endowed with resources to sustain that great position.

This tacit tender of leadership has been foreseen by the cosmopolitan lookers-on for some time and there has been much gossip as to just what modest Columbia, the Fair, would do about it. In some quarters it even has been whispered that she might play the prude.

The situation reminds one, indeed, of incidents of the brilliant society world of the American, English, French metropolis, such as occur when a great dowager-social-dictator passes on to a better world. Who will succeed her in social leadership? Madam B——? Well, of course, it is her logical right of place, but she is so retiring! cares more for domesticity than for society, abhors gossip and social intrigue, etc. The season approaches, arrives. Madame B—— sets all conjecture at rest by issuing

invitations for a brilliant ball for the *élite*. The event is the perfection of good taste and is marked by due deference for all the proprieties: just the right people present, exactly the right wines in proper quantities, etc.

The Washington Conference was the stellar event of the season. Madame Columbia did the thing properly: the right people were there and all that. The Conference served a purpose: our Columbia, in the best of taste, modestly and charmingly announced her leadership.

How did the party affect business? That is another story. Read Chapter X and the last section of Chapter IX—the *Crux of the Situation* and *Conclusion as to the Results of the Conference*.

This book should be a textbook at the War Colleges where someone should make an epitome of the salient features and facts for easy and ready digestion in tabloid form. The epitome should be printed at the Government Printing office for distribution to every member of Congress, to publicists, etc. In brief every American voter should read the book itself. As a part of that missionary work, a few further details of its subject matter may not be amiss.

For instance, the first chapter bears the attractive caption *Nibbling at Asia*, wherein the reader is served a caustic review of Japanese diplomacy and strategy in Asia, bringing up to the situation when the Conference opened. The alleged fallacy of Japanese pretensions of defensive strategy is exposed. Japan is presented in Manchuria, Shantung, Siberia. The matter of the celebrated Twenty-One Demands is explained as well as Japan's position in the Consortium and in reference to the Open (or Closed) Door. In these thirty-eight pages are some highly spicy bits of gossip which bear down heavily upon Japanese military methods in Manchuria, Mongolia and Siberia, such as the Chientao affair, the Nikolaevsk affair, the Semenoc scandal, and the exposures alleged to have been made by the delegation of the Far Eastern Republic in Washington, January, 1922, in reference to which the French and Japanese representatives denounced the documentary evidence as forgeries. It is mildly suggested that Japan has learned something of imperialistic methods from European chancelleries.

We are next treated to a set of facts about the Japanese argument of an Asiatic Monroe Doctrine and shown how very different Japanese pretensions in that regard are from the American in respect to its Monroe Doctrine. Naval readers will be interested to find the book strictly up-to-date in discussing the Langdon affair and the Wireless concession.

Chapter III explains and discusses Japanese governmental organization in its militaristic import: the power of the military hierarchy, the supremacy of the general staffs, the plutocracy of the military leaders and their control of policies.

All mysteries of the Anglo-Japanese Alliance are clarified as the sun dispells the fog, in Chapter IV. An interesting sidelight to the diplomacy that accomplished this treaty, so much desired by both the Army and

Navy parties in Japan, was the sending of Count Ito to Petrograd to arrange a treaty with Russia at the very time that the Japanese ambassador at London was negotiating for the Anglo-Japanese treaty, the purpose of the Petrograd mission being to hasten the British decision. It is said that this epoch of diplomacy was a masterpiece in the Machiavellian school, and it is worthy of note that Count Hayashi in London and Count Ito in Petrograd were working in sealed compartments: Ito being exceedingly anxious for a Russian understanding and Hayashi quite mystified over the other's activities. England signed.

England had her profit therefrom, but the author strongly intimates that this *entrée* into Occidental society bred Japanese imperialism that must be paid for in good time. It imposed imperialistic responsibilities: and it left England free to deal with Germany in the West. It is said that Japan and England co-operated intimately in working out their joint needs of naval expansion.

The original treaty made in 1902 was revised in 1905, two years before its expiration, permitting the annexation of Korea, making the military obligation universal, and including India within its scope. Whereas, originally England had obligated herself as a military ally only in case of the intervention of a third power, each of the contracting powers in 1905 promised that "If by reason of unprovoked attack or aggressive action, wherever arising, on the part of any other Power or Powers either Contacting Party should be involved in war in defense of its territorial rights or special interests . . . . the other Contracting Party will at once come to the assistance of its ally . . . ."

In 1911 there occurred one of the most interesting phases of diplomatic history in the negotiation by President Taft and Secretary of State Knox of an arbitration treaty with England. Before it was finally acted upon by the United Senate, the Anglo-Japanese treaty was amended to meet the conditions of the said arbitration treaty. Then the Senate refused full ratification of the latter!

Japan was quite unwilling to accept this attempt to except the United States from the operation of the Anglo-Japanese treaty, and there was a strong feeling in Japan that "Japan is now America's slave and India's policeman."

But as the Senate had virtually killed the arbitration treaty, the article in the Anglo-Japanese treaty exempting nations with which one or both of the Anglo-Japanese allies had an arbitration treaty was inoperative. The British Foreign Office avoided this difficulty by announcing its now-famous interpretation that the treaty concluded between the United States and Great Britain in 1914 would be considered an arbitration treaty in the meaning of the Anglo-Japanese treaty. (The 1914 treaty provided only that the contracting powers should not go to war pending investigation of their mutual disputes by an International Commission.)

The last phase is found in the part played by the British dominions hostile to the Anglo-Japanese alliance.

The story of the Washington Conference itself is, perhaps, as interesting as the gossip about the causes that led up to that momentous assembly.

In conclusion it is quite worthy of note that until recently the literature dealing with Japan available to English speaking readers was overwhelmingly pro-Japanese because writers who could pretend to familiarity with the subject were usually men of long residence in Japan, who naturally were there because they liked Japan or because their interests were allied with Japanese interests, or the writers were Japanese men like Kauwikami who is married to an American.

But it may be remarked that the older writers rather emphasized issues that are now regarded as insignificant, while later writers have reviewed the events of the greater diplomacy and the problems in power.

NOTES AND SKETCHES ON MARINE DIESEL ENGINES, by J. W. M. Sothern, D. Van Nostrand Company, New York. Price $8.00.

A REVIEW BY COMMANDER E. D. MCWHORTER, U. S. NAVY

The author states in the preface that the book is intended purely as a guide and help to engineer officers of motor ships who have been trained on lines of steam practice only and to show that there is no "magic" in the Marine Diesel Engine. The book very ably fulfils the intent of the author. It might be said to go further than the author's intent in two ways; first, it is a valuable reference book for engineer officers of motor ships who have had an average amount of Diesel experience and training and, second, in attempting to remove any idea of "magic" in Sections III and VII, "Practical Operation of Machinery," and "Running Troubles, Their Cause and Remedy," it tends to make many points appear more simple than will actually be found to exist. In other words, it is believed the engineer officer should be shown the importance of taking every opportunity, at the end of voyages or when otherwise available, of referring all matters of maladjustments, repairs, etc., to expert trouble finding and repair squads.

The first Section—"General Definitions and Explanations"—is well conceived and fairly well arranged. It permits one with limited knowledge of the subject to read and understand the book throughout without outside reference.

Section II—"Illustrated Descriptions of Various Types of Marine Diesel Oil Engines" covers the field of British manufactures and some of the most prominent continental manufacturers very thoroughly. It notably lacks mention of description of American types and of many good continental types, especially German. This is probably the fault of the engine builders in not making the information available.

The book is conveniently compiled, easy to read, accurate, and is considered a valuable reference book as concerns the subject of Marine Diesels.

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